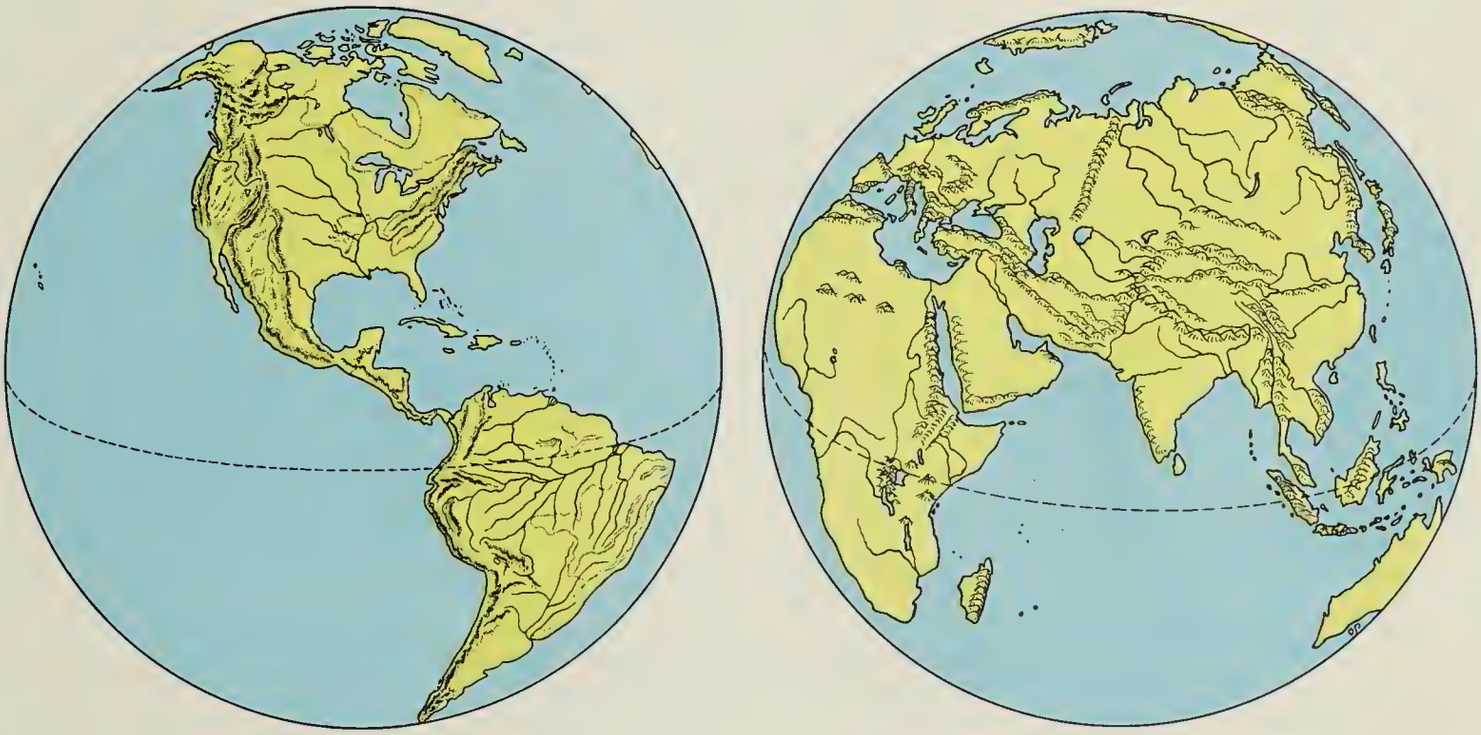
Homelands

OF THE

World

HOMELANDS
of the
WORLD

Geography-Centered Social Studies



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TITLES IN THE HOMELANDS SERIES

Homelands of the World
Homelands of the Americas
Homelands Beyond the Seas
Our Homeland and the World

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TO THE TEACHER

The Homelands Social Studies Series presents a complete program for the development of a clear understanding of our world, the people in it, and the way they live. Emphasizing the interrelationship of man and his physical environment, this completely up-to-date series furnishes the solid basis of geographic understandings essential for effective learning in all areas of the social sciences.

Homelands of the World is especially designed to acquaint us with the global nature of our world. The earth is introduced as a giant ball. At first glimpse, it seems very large indeed, with a great variety of natural regions and many different people. As the earth grows more familiar to us, however, we find that distances between the most far-flung regions seem not so great after all, and people all over the world seem to be basically very much alike. We discover that modern transportation has shrunk the world. We learn that people on all parts of the earth are seeking to meet the same fundamental needs and that many differences in their ways of life are largely the result of variations in their physical surroundings. We find, too, that man is gaining more and more control over his environment: through irrigation or drainage, wastelands are made productive; with modern machinery, highways are built through formerly impassable mountains and jungles; and through the wonders of air conditioning, the hottest and the coldest portions of the earth may be made habitable. As man's mastery over his surroundings increases, we will find the world growing smaller still and the lives of people in all the Homelands of the World will grow more and more alike.

Homelands of the World is carefully organized to provide a gradual expansion of interest from our own community, to other communities in our nation, to communities in other nations around the world. Our understanding of basic similarity among people the world over is enhanced by exploration of various communities within the same climatic zone. Thus, we see, for example, that people of the tropics live very much the same way the world over. We realize that many of the differences in the ways people live result from differences in the physical conditions under which they live.

Homelands of the World presents these and other essential concepts in simple, clear language, in an interesting, narrative style that guaranteees continual stimulation. The vocabulary level is well controlled. The only geography terms introduced are those necessary for mastery of the ideas presented at this level. Textual concepts are re-enforced and augmented by a rich variety of special learning aids.

Illustrations. A wealth of carefully selected illustrations, many in full color, greatly enriches *Homelands of the World.* These illustrations, with their thought-provoking captions, bring a greater reality to the verbal concepts introduced by the text.

Maps. The wide variety of graded maps included in *Homelands of the World* provides for the review and expansion of the fundamental map skills that have been introduced on lower levels. The selection of maps is carefully integrated with the text itself, to guarantee maximum correlation between verbal and visual learning. Map study exercises provide periodic checks on mastery of these skills.

Unit-Culminating Activities. At the end of each unit of *Homelands of the World,* a selection of provocative questions and suggested activities offers an effective, interestingly varied review. The suggested activities, moreover, open the door to explorations in greater depth of topics of special interest to the class or to individuals.

Geography Dictionary. A glossary of important geographic terms appears at the end of *Homelands of the World.* This comprehensive glossary, with its pronunciation key for difficult words, is an invaluable aid for reference and review.

Index. The index for *Homelands of the World* is outstandingly thorough. Entries are referenced not only for the text proper but for maps and illustrations as well. The pronunciation key for difficult words insures oral mastery of the terms presented within the text.

A MAP LIST

THE WORLD

Parabolic Equal-area Projection

Scale 1780 miles to one inch

0 1000 2000 3000

TABLE OF CONTENTS

From the Walt Disney True-Life Adventure Film, THE AFRICAN LION. © Walt Disney Productions

THE AFRICAN LION, KING OF THE BEASTS, AND HIS QUEEN, THE LIONESS

These pictures were taken in the home of the lions, the wild Grasslands of Africa. You will read about these Grasslands in this book.

Brown Brothers

Magellan sailed westward to find a better route to Asia and proved the world was round.

Unit I

LEARNING ABOUT OUR WORLD

Long, long ago people knew very little about our world. They had no idea that there were huge bodies of land other than the one on which they lived. Some knew that if they traveled far enough in any direction they would come to a great body of water. It was so large that no land showed beyond it. They did see, however, a line far from shore where water and sky seemed to meet. That was strange, for overhead the sky seemed far away. So the people said, "This world of ours is just a mass of land floating in a larger body of water. The sky is like the inside of a great bowl turned upside down. Its edge meets the water far from land."

Even after people of far-off times had learned to build ships, most sailors were afraid to sail out of sight of land. What terrible thing might happen to them if their ship reached that distant edge of the water!

Our World. More than two thousand years ago, some men came to have a very different idea of the world. From their study of the sun and the stars, these men decided that the earth must be round like a ball. One man even figured out the size of the earth.

Perhaps, one night, you looked at an eclipse of the moon. There was a dark shadow creeping over its face. This was the shadow cast by the earth when it came between the sun and the moon. Perhaps you noticed that the edge of the shadow was round. That helped to show that the earth itself is round. Probably this round shadow helped the men of old to believe the same thing.

As time passed, seamen sailed farther and farther from the shores of their own land. Some even had the courage to sail out of sight of their homeland. In this way, they discovered new and distant lands. More and more, thinking men began to wonder if, after all, the earth was shaped like a ball.

These men knew, as you do, that if you start at any point on a ball and draw a line around it, without changing direction, you will finally come back to the starting point. Some of them had discovered distant lands, but they went and came by the same route. Now they said, "If the earth is round, perhaps there is an easier way to reach these distant lands, by going in the opposite direction from that which we followed."

People in Europe had reached Asia by sailing eastward around Africa. Magellan, a great sailor, decided to see if he could find a better route by sailing westward. Leaving the country of Spain with five vessels, he sailed westward into unknown waters. Weeks later, he found land blocking his way. He spent months trying to find a waterway through it. Finally, Magellan went around this land through a stormy passage. He sailed on with only three ships. One had been sunk, and the frightened crew of another had turned back.

Months later, when nearing Asia, Magellan and some of his men were killed by natives of an island. There were only enough men left to sail one ship. This ship reached Asia safely. After loading with goods, it started homeward, still sailing westward. Three years from the time the five ships had sailed away, this lone ship reached home. It had shown that our earth really is round.

Today, great passenger ships sail around the earth in three months or less, making many stops. In still less time, a traveler may go around the world by using railroads across the land and steamships across the water. Jet airplanes have flown around the earth in less than four days.

It is hard for us to understand how huge our earth really is. When we look about us, we can see but a tiny bit of the earth's surface. If we climb a mountain and look off from the top, we see but a very small part of the world. It is so very large that even high up in an airplane, we still are not far enough from the earth to see if it is a ball. Only by traveling many, many miles out into space would we be able to see the earth as the great ball that it is.

The Globe. To get a clear idea of what our world looks like, we need to see a good model of it. The best model of the earth is a *globe*. A globe is a large ball. On the outside is painted or pasted a picture, or map, of the land and water surfaces of the world. It shows us how our earth would look if we saw it from far, far off in the sky.

Directions. Look at the globe in your classroom and see how it is made. Perhaps it is like the one in the picture. Notice that it turns around a rod, which

runs through it and is fastened to a standard. At one end of the globe, where the rod comes through, you will find the North Pole. At the other end of the rod, is the South Pole. If your globe has no rod, you can still find the poles, and imagine a rod through them.

Wherever you are on the earth, if you go toward the North Pole, you are going north; and if you go toward the South Pole, you are going south. So you see that *south* is opposite to *north*.

There are two other main directions on the earth: *east* and *west*. If you face north, east is to your right, and west is to your left.

Black Star

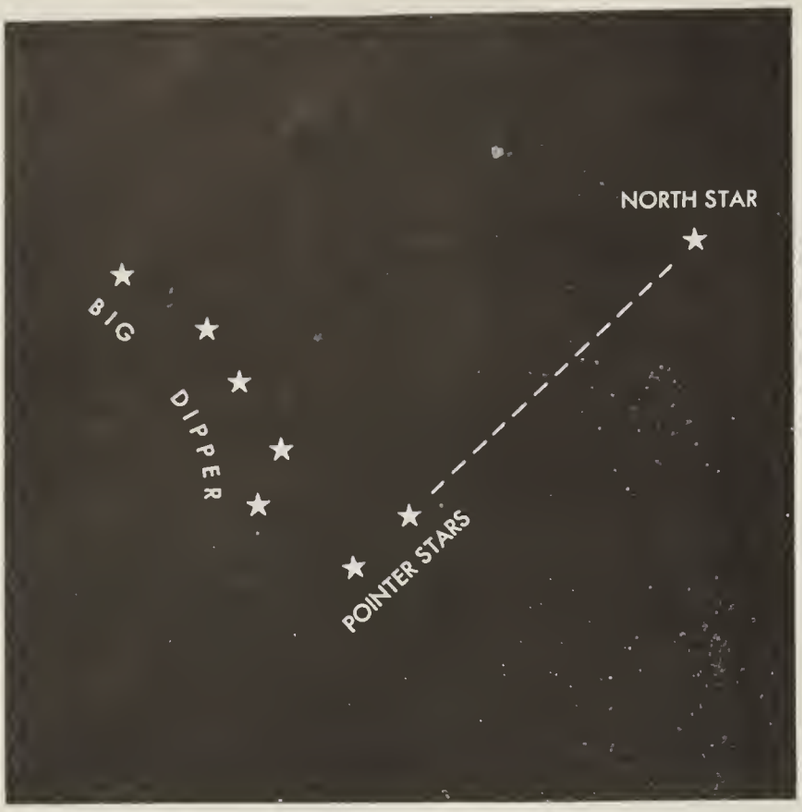
The globe shows us how our earth would look from far off in the sky.

The Sun and the North Star. In our homeland, the sun is in the south at noon. If you face the sun at noon, you will be facing south, and your shadow will be behind you. Toward what direction will your shadow point? What direction will be to your left? To your right?

Many, many years ago, shepherds and night travelers used to watch the stars. They found that all but one of the stars they watched changed their positions in the sky as the hours passed. This one star seemed to stand still. So people learned to tell directions by it. Today, we call it the *North Star,* because we know that it remains directly over the earth's North Pole. When you look up at it, you are facing north. What direction will be behind you? To your left? To your right?

Even today, in the northern half of our earth, people lost in a strange country turn to the North Star to find their way. It is easy to find this star on a clear night. Hunt for a group of bright stars that look like a dipper with a slightly bent handle. This group is called the Big Dipper. The two stars on the outer side of the dipper are called the "pointers." Look along the line they form. Some distance away you will see a fairly bright star with no other stars near it. This is the North Star.

The Earth's Surface. On a globe, the water surfaces of the earth are usually



We may locate the North Star by means of the group of stars called the Big Dipper. Can you find them in the sky?

colored blue. The land areas are shown in other colors. This makes it easy to tell the land from the water. Look at the globe. Turn it slowly until you have seen the whole of its surface. Do this several times. Would you say there is more land than water on the surface of the earth? Or is there more water than land? Actually, about three fourths of the earth's surface is water and just over one fourth is land.

Suppose you turn the globe until you see two large bodies of land much alike in shape. One is south of the other. They are connected by a narrow strip of land. You find the name North America on one of these. The other great land is named South America. These two large bodies of land are called *continents*. We live on the continent of North America.

Do you see a large body of land south of South America, at the South Pole? It is the continent of Antarctica. See how large this continent is.

Notice the large bodies of water that touch these three continents. They are called *oceans*. North of North America is the Arctic Ocean. To the east of North America and South America is the Atlantic Ocean. West of North America and South America is the Pacific Ocean. Find each of these oceans on the globe. Their names are printed on them.

Suppose you turn the globe very slowly to the left, so that more and more of the Atlantic Ocean comes into view. Suddenly some more land appears. It is another continent, called Africa. North of Africa is Europe, a smaller continent.

Keep on turning the globe and you will see a large continent which joins Europe along one edge. It is Asia. Europe and Asia are sometimes spoken of as one continent and called Eurasia. South of Asia is the continent of Australia.

There are seven continents. Count them on the globe and name them. Which of these continents appears to be largest? Which do you think is the smallest? Asia is the largest continent, and Australia is the smallest.

Suppose you look for oceans again. You already have seen three, the Atlantic Ocean, the Pacific Ocean, and the Arctic Ocean. South of Asia we find another ocean, the Indian Ocean. Now turn the globe about and count the oceans. You will find there are four.

Turn the globe so that, one by one, you get a view of each complete ocean. Which ocean is the largest? Which appears to be the smallest? You will be sure that the Pacific Ocean is the largest ocean. The Arctic Ocean is the smallest.

While looking at the globe, you have probably seen a number of bodies of land wholly surrounded by water. They are very much smaller than the continents and are called *islands*. See if you can

FIVE VIEWS OF OUR EARTH

We learn much about our world by looking at the globe from different directions.

find a number of islands between North America and South America. Look for a large island east of Africa. Magellan's ships landed at islands near Asia, and between it and Australia. See if you can find this group of islands on the globe.

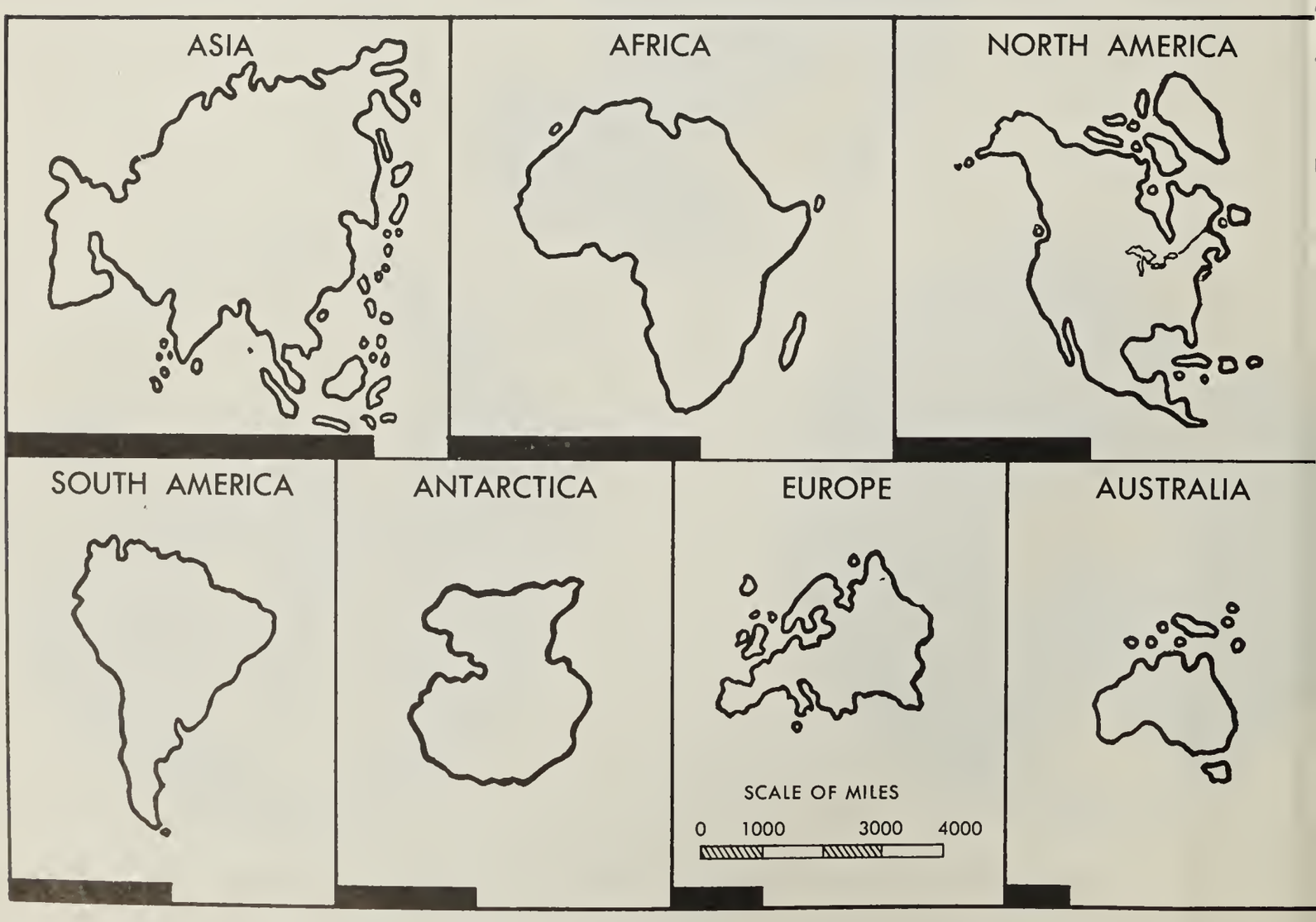
Hemispheres. Look down at the globe around the North Pole. Look at the globe around the South Pole. With your eyes looking at the center of the globe, turn the globe slowly on its axis. You see that you can have many different views of the globe. But is there any view in which you see all of the globe at once? Try it. You will find that any view of the globe shows only half of it. A half of the globe, or of the earth it represents, is a *hemisphere.*

Motions of the Earth. Our earth is not a still body, floating in the heavens. It is always moving. More than that, it moves in two different ways. Each of these movements has much to do with our lives.

You have turned the globe around on its rod, or axis. The earth has no axis, but we pretend it has one, running through it from the North Pole to the South Pole. The earth turns as steadily as if the axis were really there. This is one motion of the earth. But the earth also travels around the sun. It will be interesting to see what happens because of these movements.

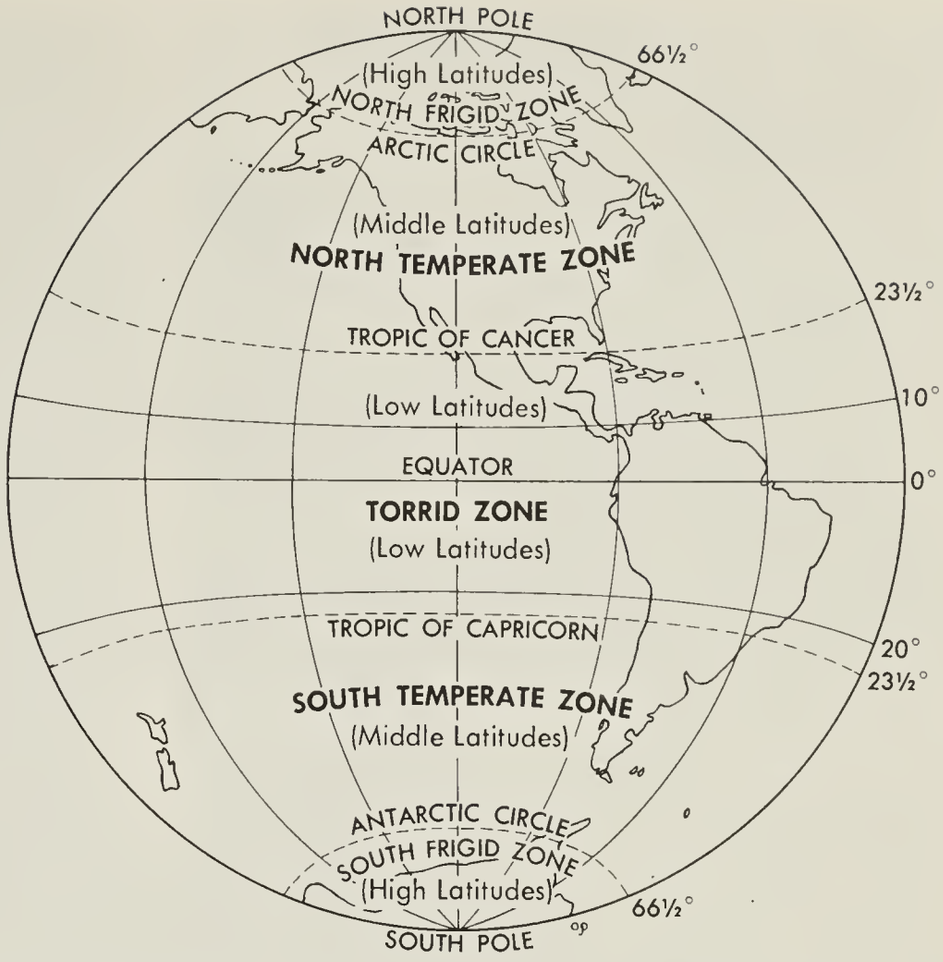
Day and Night. You have already found that you cannot see all of the globe at one time. Now, suppose you try something else. You can use the globe, or use a large

Here are the seven continents in order of size. Compare them with the continents shown on the globe. The black bars show how the continents differ in size.



rubber ball with a long knitting needle stuck through its center. What does the knitting needle stand for?

Hold the ball in the sunlight or before an electric light. See if you can turn the ball on the knitting needle so that all its surface will be brightly lighted at the same time. You cannot do it. Part of the surface of the ball is in shadow. As you turn the ball, the part that was light becomes dark, the part that was dark becomes light. This is just what is happening to our world as the earth turns.



This view of the globe shows you the five zones, and the imaginary lines which separate them.

The earth turns completely around once each day, just as we made the ball turn around on its axis. As the earth turns, it is *day* on the part of the earth that faces the sun, and it is *night* on the part of the earth that is away from the sun. While the sun shines on part of the great earth ball, the remainder of the earth is in shadow, or darkness. The dark and the light parts are constantly changing. Each complete turn takes 24 hours. With each complete turn we have light and then darkness, or day and night.

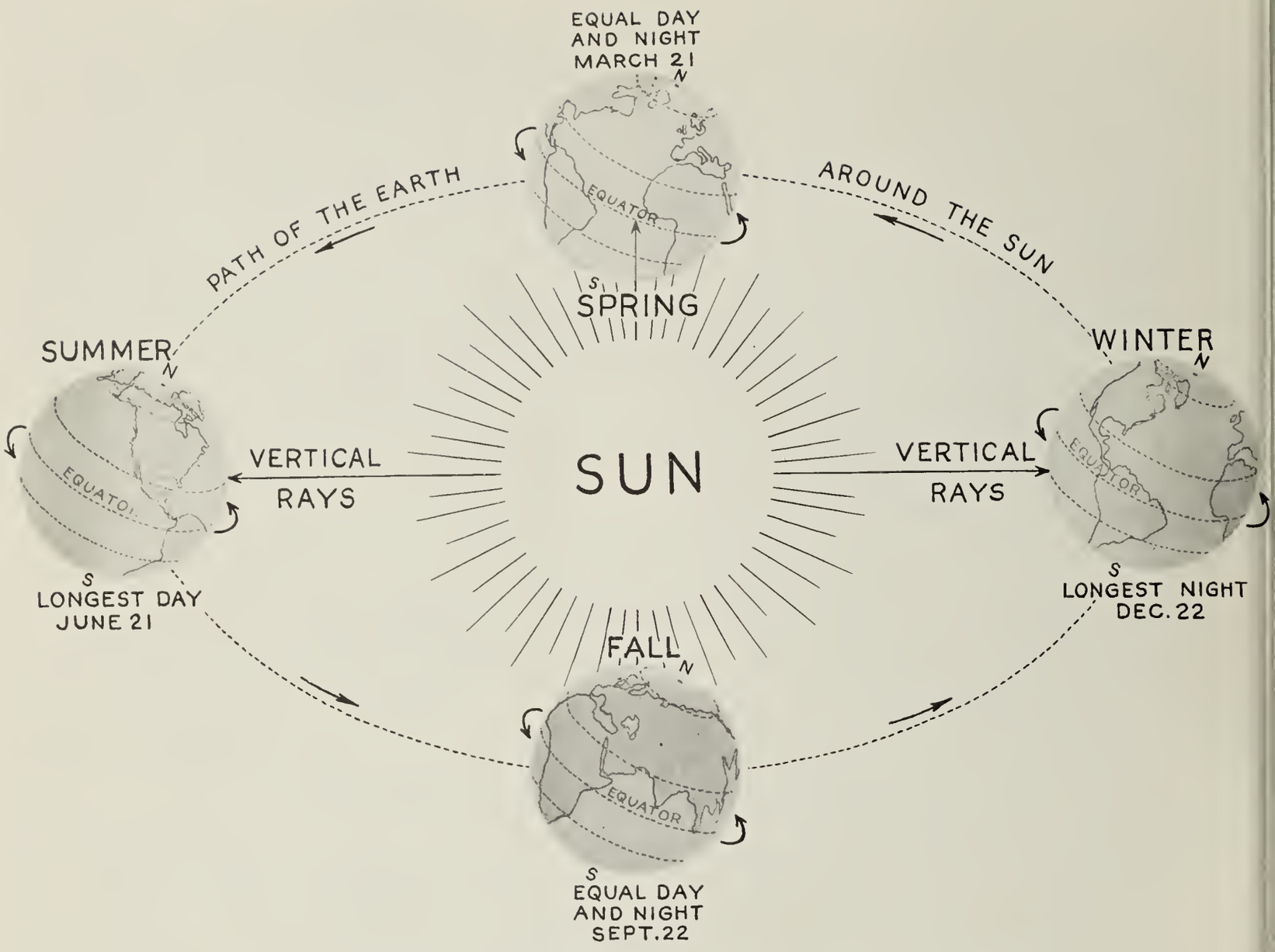
Can you see why some children in distant lands are going to bed when we are getting up? Is it clear that some children on the other side of the world are looking at the stars when the sun is shining for us?

The Year. We have learned that the earth *rotates,* or turns on its axis, once each 24 hours to give us our day and night. The earth has a second movement. The earth *revolves* around the sun. The time it takes the earth to go completely around the sun is our year.

Why One Land is Hotter than Another. There are a number of reasons why one land is hotter than another. The winds may have much to do with it. The nearness of great bodies of water may change the temperature of a land. There are other causes. One of these depends on how nearly the sun is directly overhead.

You know that you feel the heat of the sun more when it is overhead at noon than when it is low in the east at sunrise. In the same way, lands where the sun's rays are more directly overhead are likely to be warmer than lands where the sun is never directly overhead.

On your globe, you will find five named circles around the earth. These



This drawing shows the path followed by the earth in its yearly passage around the sun. Notice the four seasonal positions.

are not real lines. They are only imaginary lines, but they are very helpful ones.

Find the Equator on the globe. It is equally distant from the North and South poles. You see that it divides the earth into two equal parts, or hemispheres. You will make use of the Equator again and again in your study of geography.

North of the Equator, look for a second imaginary line. It is called the Tropic of Cancer. This line shows you the farthest North that the sun ever shines directly overhead. An equal distance south of the Equator is the Tropic of Capricorn. This line marks the farthest south that the sun's rays are directly overhead. The part of the earth between these tropics is called the Torrid Zone or the Low Latitudes. Torrid means "very hot." The lands of the earth which are hot all the year lie in or near this zone. These lands and their waters form the Hot Belt of our earth.

Find the Arctic Circle, far north of the Equator, and the Antarctic Circle, far south of it. These imaginary lines show the farthest points north and south that

H. Armstrong Roberts

Trees sprout new leaves and plants bloom in the spring.

H. Armstrong Roberts

Cool lakes and waterfalls are refreshing in the summer.

the slanting rays of the sun reach every day in the year. The part of the earth between the Tropic of Cancer and the Arctic Circle is called the North Temperate Zone or Middle Latitudes. Between the Tropic of Capricorn and the Antarctic Circle lies the South Temperate Zone or Middle Latitudes. The lands which have four seasons lie in or near these zones and form the Temperate belts.

The Arctic Circle and the Antarctic Circle enclose parts of the earth where the sun's rays do not fall for a part of each year. The period of darkness is shortest near the circle and longest at the poles. The surface within the circles forms the North Frigid and South Frigid zones or High Latitudes. Lands within these circles usually have long, cold winters and short summers.

The Sun and the Seasons. You have just learned that the Temperate belts have four seasons. The Cold belts have a long, cold winter, and a short summer. Even the Hot Belt, while always very hot, has very slight differences in heat at different times of the year.

We usually think of March, April, and May as the spring months. Plants begin to grow and bloom, and trees send out new leaves in spring. We think of June, July, and August as the summer months. During these months, we have the most heat. September, October, and November are the fall months. During these months, the air grows cooler, and many trees lose their leaves. We think of December, January, and February as the winter months. Then we have our cold weather. This grouping of the months is not exactly true. Spring does not start

H. Armstrong Roberts

In the fall, many trees lose their leaves.

H. Armstrong Rober

Blankets of snow add beauty to northern winters.

on March 1, but later in the month; summer does not start on June 1; fall on September 1; or winter on December 1.

What causes these changes of the seasons? You have noticed that, in spring, the weather grows gradually warmer. During summer, we have hot weather. In fall the weather grows steadily cooler until in winter we have real cold. This looks as if the heat of the sun caused the seasons. But the sun gives off the same amount of heat all the year, and yet we have different seasons. What really causes the seasons is the movement of the earth.

You remember that the earth has two movements. It turns, or rotates, on its imaginary axis once each twenty-four hours, to give us our day and night. It also moves around the sun in a great oval path once each year. Can you picture the earth always moving along its path around the sun? Because the path is oval and not an exact circle, the earth is sometimes farther away from the sun than at other times. This does not give us our seasons, though.

When you are looking at the globe, do you wonder why its axis is tilted? Why isn't it straight up and down? It is slanted because the earth's imaginary axis slants exactly the same way. It always slants in the same direction as it passes around the sun. Notice on page 8 that the axis slants in the same direction in the drawing, which shows where the earth is on March 21, June 21, September 22, and December 22.

On March 21, the rays of the sun fall directly on the Equator at noon. On that date, spring begins in the North

Temperate Zone. By noon of the next day, the earth has moved a little in its path around the sun, and the sun's rays do not fall directly on the Equator, but just a bit north of it. Each following day, the rays strike farther north, and the northern part of the world gets more and more sunlight. This means more heat, and the days grow warmer and warmer. During this time, the southern part of the world gets less and less sunlight and less heat from the sun. There the days grow colder and colder. This explains why the South Temperate Zone has its fall season when we are having spring.

On June 21, the rays of the sun fall directly on the Tropic of Cancer. This is as far north as they ever strike from directly overhead. Then summer begins in the North Temperate Zone and winter in the South Temperate Zone.

On September 22, the sun shines directly on the Equator once more. Then our fall begins. In the South Temperate Zone, spring starts. Slowly the earth travels on. Gradually the sun's rays strike farther and farther south until December 22.

On December 22, the rays fall directly on the Tropic of Capricorn. This is as far south as they ever strike from directly overhead. From then until March 21, the South Temperate Zone has its summer, while the north has winter.

Doesn't it seem odd to think that, when we are celebrating Christmas and New Year's Day with snow on the ground, people in the South Temperate Zone are celebrating these holidays in hot summer weather, with flowers all in bloom?

Other Things a Globe Tells. There are many other things a globe will tell you as you go on with your study. For example, you will find, here and there, wavy, crooked lines running across the land. These show where large flowing streams, or rivers, are found. See if you can find one such river in the middle of our own country, the United States. See if you can find others in South America, in Africa, and in Asia.

There are little spots of blue in the land areas. These mean *lakes,* or large bodies of water entirely surrounded by land. See if you can find a group of such lakes along the northern edge of our country.

In later pages of this book, you will imagine yourself traveling with two children across our homeland. In the same way, you will visit distant homelands around the world. The globe will show what lands and oceans you must cross to reach them. These trips will seem more real when you have the globe to help you.

A Special Note on Temperature Belts

Some geographers prefer to use the terms Low, Middle,and High Latitudes when discussing the Torrid, Temperate, and Frigid Zones of the earth. If you will look at the view of the globe on page 7, you will see that both names are shown for each of the five zones. You can see that the high latitudes are found at the poles while the low latitudes are found just north and south of the equator. The middle latitudes are found between the high and low latitudes.

QUIZ QUESTIONS

1. What did people of long ago say about the earth?
2. What do we now know the shape of the earth to be?
3. What sailor led his men on a voyage which became the first trip around the world?
4. In what ways, other than by ships alone, can people go around the world?
5. What is a globe? What is its axis? Has the earth an axis?
6. What part of the earth's surface is land?
7. What name is given to the largest bodies of land on our earth? Name at least five of these bodies.
8. What are the largest bodies of water called? How many of these bodies are there? Name the largest.
9. How many views of the globe are possible?
10. What is a hemisphere?
11. In what two ways does the earth move?
12. Which movement of the earth causes day and night? Which causes the seasons?
13. How can you tell directions by the sun? By the North Star?
14. What part of the earth has the most sunshine?
15. In which season does the Arctic region have the most light?
16. In what season do we have the shortest days?
17. What season does Australia have when we have winter?
18. What things can you learn from the globe?

USE THE GLOBE

1. Our earth turns from west to east. Rotate the globe in that direction.
2. Find our country and Europe on the globe. If a ship sailed from one to the other, what ocean would it cross?
3. Locate the part of Asia that is nearest North America.
4. The continent of Australia is sometimes called the Island Continent. Look at the globe and see if you can tell why.
5. Turn the globe so that you can see the whole of the Atlantic Ocean. What continents does it touch?
6. From the globe, find what continents the Arctic Ocean touches.
7. Read the zones in order from south to north.
8. In sailing around the southern tip of Africa, you would pass from what ocean to what ocean?
9. Find an island on the globe. If its name is given, tell what it is. In what ocean is it? What continent is it nearest?
10. A sea is a body of water that is much larger than a lake and is partly and sometimes wholly surrounded by land. Turn the globe until Africa appears. North of it, find the Mediterranean Sea. What continents does it touch?

Ewing Galloway, N. Y.

Small areas of the world are easier to study from maps printed in books.

Unit II

MAPS — THE ROUND EARTH ON FLAT PAPER

Using the Globe. The best model of the earth is the globe. Like the earth, the globe is round. The lands and the oceans have the same shape as on the earth. Of course, every land or water surface shown on the globe is very, very small compared with its real size on the surface of the earth. In fact, little lakes, rivers, and islands are too small to be shown at all on the globe.

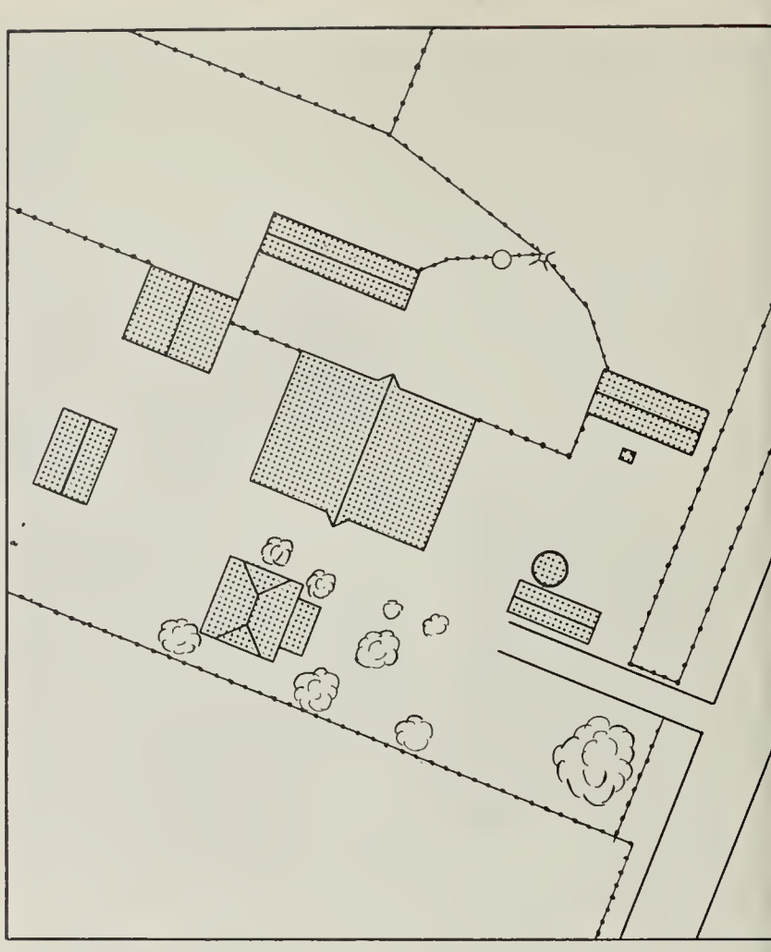
Find our own United States on the globe. Notice how small it appears. Can you imagine trying to show all our country's rivers and mountains and its thousands of cities and towns in this small space? You would need a very, very large globe to show even a part of these things.

There is something else to remember. Most of the time, we need a picture of only a small part of the earth's surface. It may be our neighborhood or the state in which we live. In the case of a state, we wish to know about its rivers, mountains, lakes, railroads, towns, and cities. A globe large enough to show these things would be far too large to carry around.

Maps—Flat Pictures of the Earth. We need, then, some other form for representing the earth and any desired portion of it. It must be easy to handle. It

J. W. Manigal, from Philip Gendreau, N. Y.

This photograph of a farm was taken from an airplane.



A map drawn of the same farm.

must often show more facts than the globe can show. We find this form in the *map*. A map is a flat drawing of the earth's surface or a part of it.

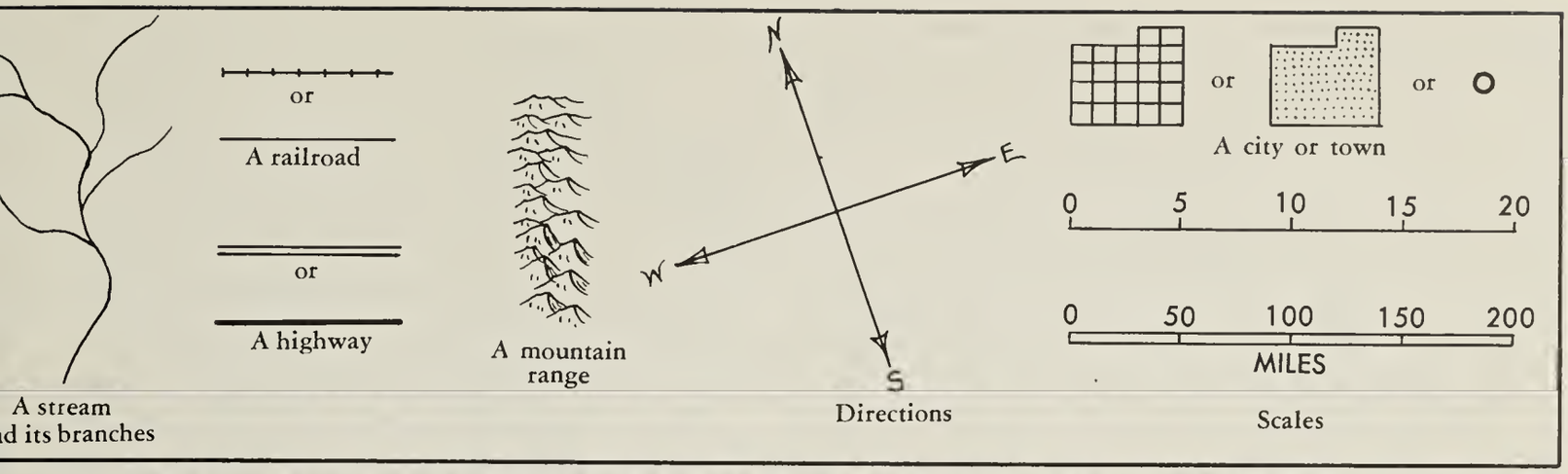
If the map is of a small area, such as your home state, it may show the land and water surfaces, and the locations of cities. A large map of a particular area can show more facts clearly than a small one. Because a map is flat, it can be laid on a desk or printed in a book. If it is a very large map, it can be folded as you may have seen a road map folded. Thus it is easy to carry about.

If you compare a photograph of a small piece of land with a map of the same area, they will look very different. Look at the photograph and the map on this page. Select two or three objects shown in the photograph and tell how they are shown on the map.

Map Symbols. Map makers use signs, or *symbols,* on their maps to stand for certain things. A symbol becomes as easy to read as the sign + in your arithmetic. Some common symbols are shown on page 15. Some of them, you will notice, suggest the things they represent. If you have followed along a bank of a stream, you have noticed that it twists and turns as it flows along. It seldom follows a straight line. So the symbol for a stream is a twisting, turning line. In a color map, the symbol is sometimes drawn in blue, because blue is the color symbol for all water.

If you have visited the mountains, you have seen them rise in long ridges or in sharp peaks from the lowlands. The symbols for mountains suggest these ridges and peaks.

Of course you have noticed that a railroad track consists of two equal-spaced lines of rails laid on cross-timbers, or ties. In the symbol, one of the rails is shown with the little cross-ties. You



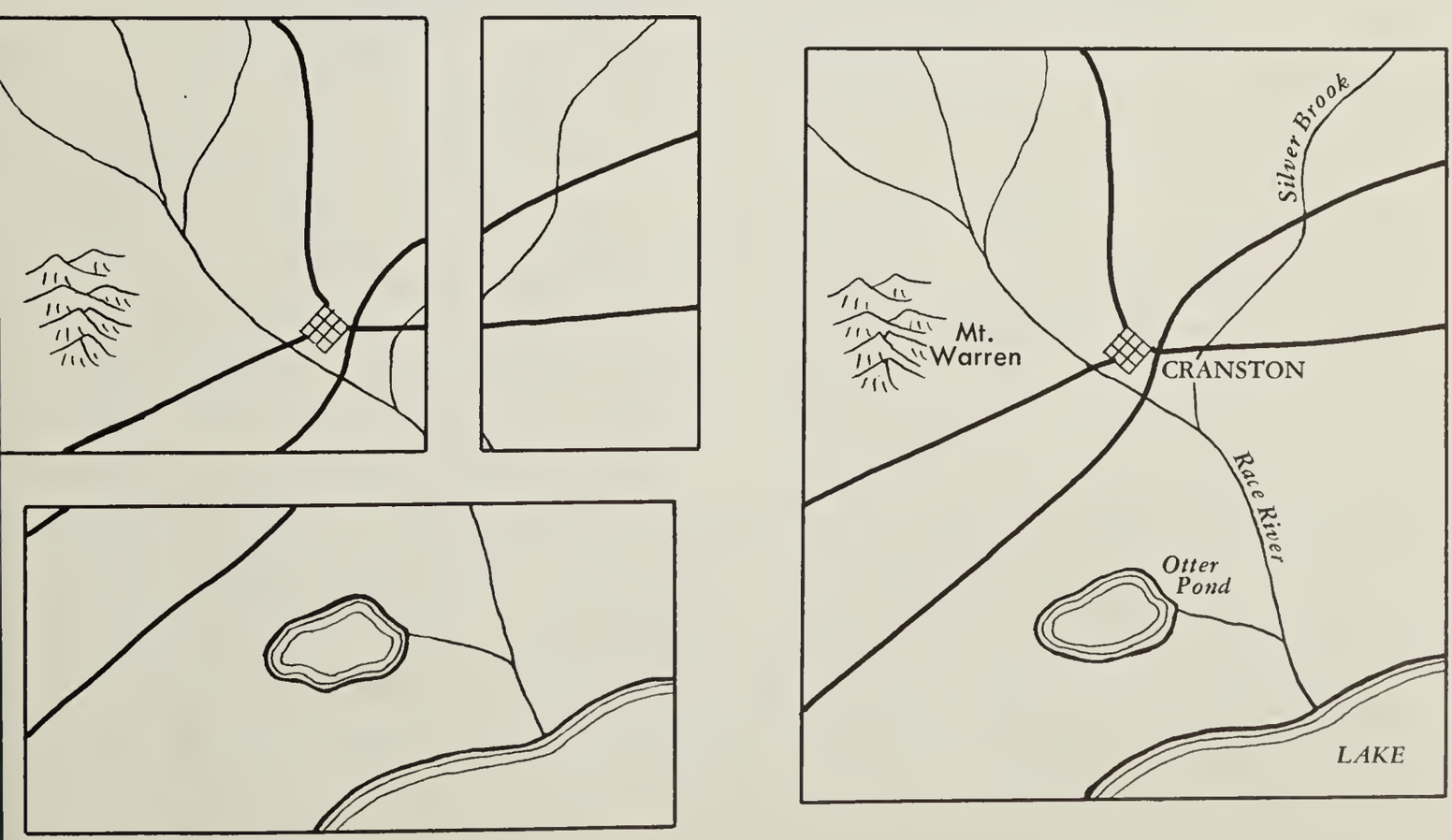
Common signs, or symbols, used on maps help explain the important features of the area.

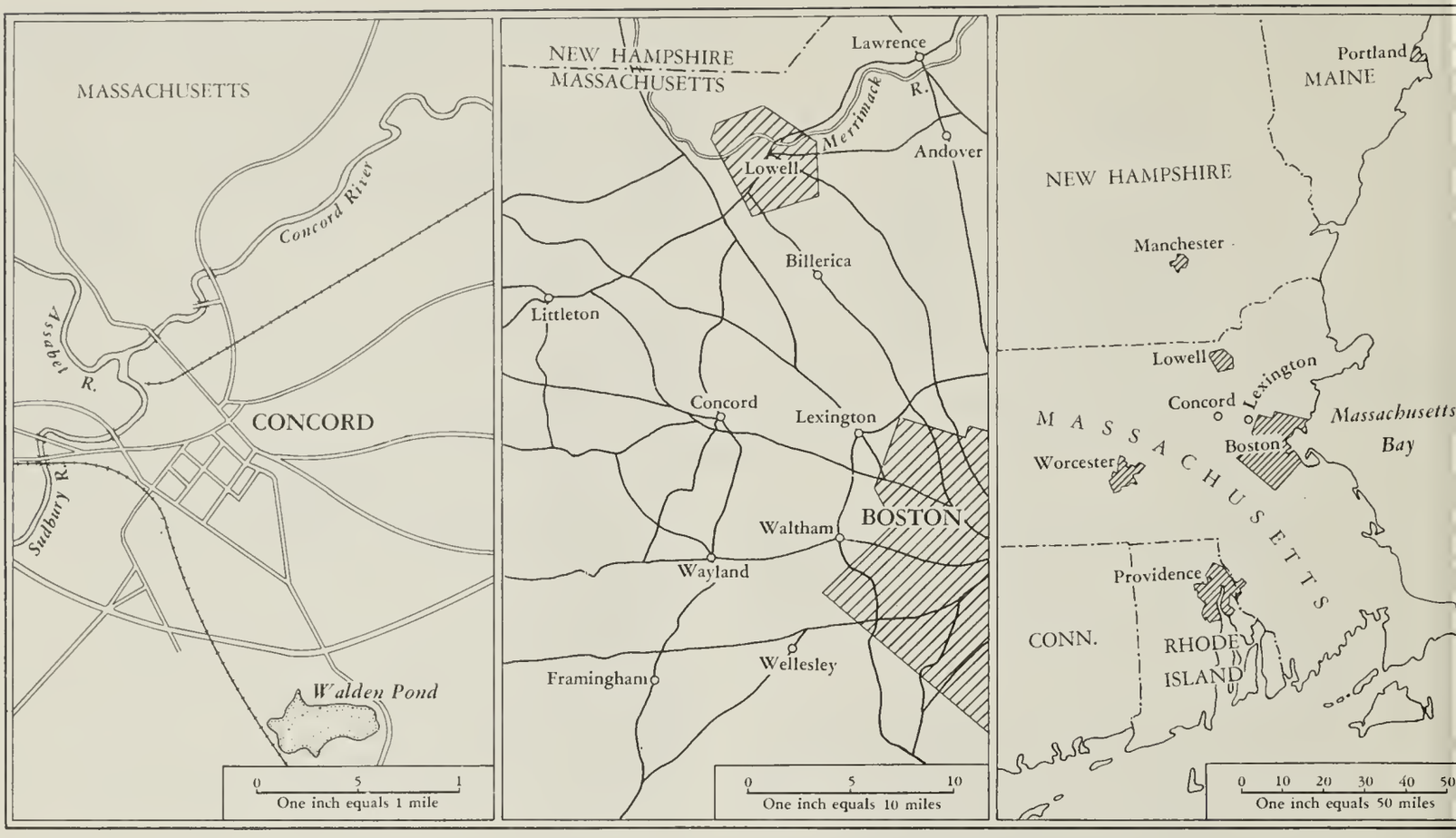
can never mistake this symbol for the one for a highway. But, on small maps covering a large area of land, railroads are often shown by thin black or red lines.

It is often helpful to know the directions on a map. For this purpose, the direction symbol should appear. N stands for North. What do the other letters stand for? Frequently, the top of a map, as it appears in a textbook, is taken as North. But this is nothing more than a fairly common custom. Often a better map can be made with North in some other direction than the top. Turn to the map, or picture of the globe, on page 3. Now think! Where is the north direction in this map?

Map Scales. Every good map is carefully drawn to a scale. The scale tells you what length on the map stands for what length on the surface of the earth. Thus a map scale of *1 in.=10 mi.* means that a distance of one inch, measured

The three maps of small areas, shown on the left, are combined to make the map on the right. All maps are drawn on the same scale.





The greater the distance a one-inch scale stands for, the greater is the surface shown. Individual objects appear smaller.

on the map in any direction, is equal to a distance of ten miles, measured on the corresponding portion of the earth's surface. Two towns shown on a map are three inches apart. If one inch stands for a true distance of ten miles, three inches stand for 3 x 10 miles. What is the true distance between the towns?

As you see in the symbols, a scale may be shown by a line. Over or under the line is written the numbers of miles or feet it stands for. Sometimes the line scale is divided into parts. Each part is properly marked, so that longer and shorter true distances can be read. By marking off the map length between two points on a slip of paper and comparing it with the scale, it is possible to find the true distance between the points.

Early Maps. Early maps of our earth were first drawn from map sketches made by sailors and explorers. The men who made voyages, in early trade between Europe and Asia or Africa, drew rough maps of the land areas they passed through. They could tell directions, but distances were far from correct. Explorers, too, like Magellan or Columbus, seeking new ways to Asia, discovered new lands. They made maps of them, but they could not know the vast size and shape of each land. The natives could tell them little, so they had to guess at a lot. The result was that early maps make the earth look very strange indeed.

Building Maps Today. Today we build up maps of smaller areas in much the same way. Only now, we have means of measuring very carefully and accurately. We can draw maps of parts of an area and fit them together to make the full map. Study the three little maps. Then

see how they are fitted together into a single map on page 15. This map shows the town of Cranston. Tell what else the map shows.

Changing Scales. One other thing you should remember about maps is this. The more ground you try to cover in maps of the same size, the smaller will appear every object that is pictured in it. On the opposite page are three maps. Measure them and you will find they are exactly equal in size. The first map is drawn on a scale of 1 in.=1 mi. Notice how it shows up the small town of Concord. The town's streets are shown by crossing lines. Notice the size of the pond and the length of the river.

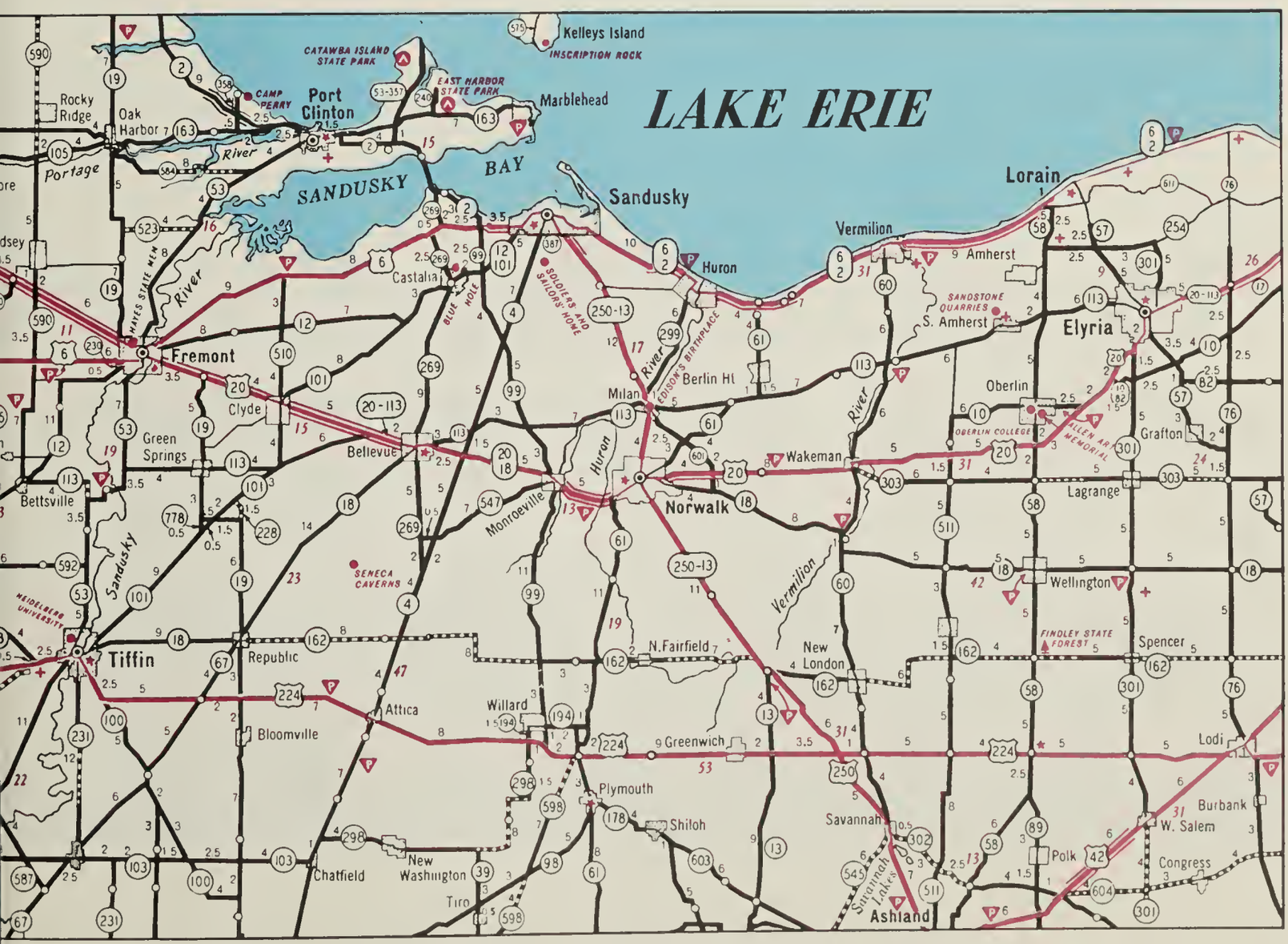
The second picture is made on a scale of 1 in.=10 mi. The map covers a much larger area. But notice how much smaller everything appears. In what form is the town of Concord now shown? What other towns do you now see?

The third picture is made on a scale of 1 in.=50 mi. Compare this map with each of the other two. What differences do you find? If you wished to show your home town, or nearest town, with its streets and parks, would you have one inch on your map equal a large or a small distance?

Use of Maps. You will become familiar with many kinds of maps as you go on with your study of geography. You will

A road map of a part of the State of Ohio. Find each symbol mentioned in the story of this map.

Simplified by permission of the Ohio Department of Highways



find them very helpful. In fact, there are many things about the earth that would be hard to understand without the help of maps and the globe.

Those who study geography are not the only people who use maps. They are used in everyday life in many ways. Large city maps, which show streets, bus lines, and parks, are used by visitors. The city postmaster uses them to plan routes for the postmen who deliver mail to your door.

If your father has a car, you have seen his road maps. They show him the roads and distances from town to town. He can plan, from the map, what roads to take to reach a certain place and how many miles he must travel. See the road map shown on page 17. It is a portion of a map for the state of Ohio.

Reading a Road Map. Before attempting to read a road map, it is important to turn to a table of symbols, which is printed beside the map. While some symbols are alike on all maps, others are different. On this map, the heavy red lines and black lines stand for modern paved highways. The red lines show United States highways, which usually run into other states. The black lines show state highways. The many kinds of highway lines show different kinds of pavements.

Every main highway has a number. The number of a United States highway appears inside a shield, placed within or over the highway line. The number of a state highway is shown in a circle. Find a numbered highway of each kind.

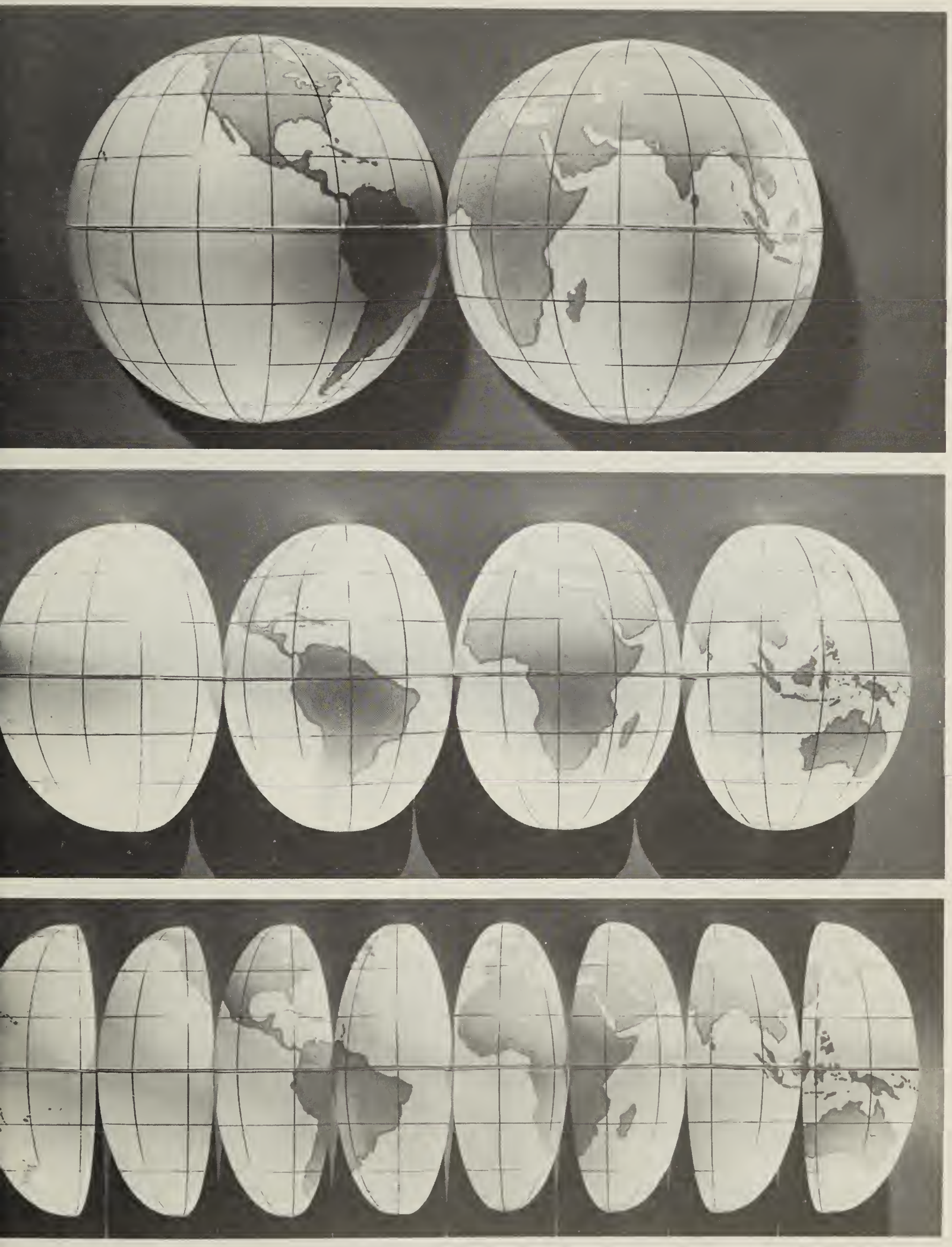
Above the road lines, you will find figures in black or red. If you look closely, you will find tiny red stars. A red figure between two red stars shows the number of miles between them. A black figure shows the number of miles between the nearest crossroads on each side of it. Find a red figure and a black figure on the map and explain them.

There are a number of other symbols on the road map. Notice that larger cities and towns are marked by a dotted area, showing their boundaries. Small villages or towns are shown by tiny circles, with the names of the places beside them. Forest parks are marked on the map by tiny red pine trees. Roadside parks are marked by a red triangle, which has a white 'P' within it. First aid stations are marked by a red cross.

You will find it fun to study this map. Take two cities quite a distance apart. What does your map tell you about a trip between these two points? Then get a road map of *your* state. Compare the two maps.

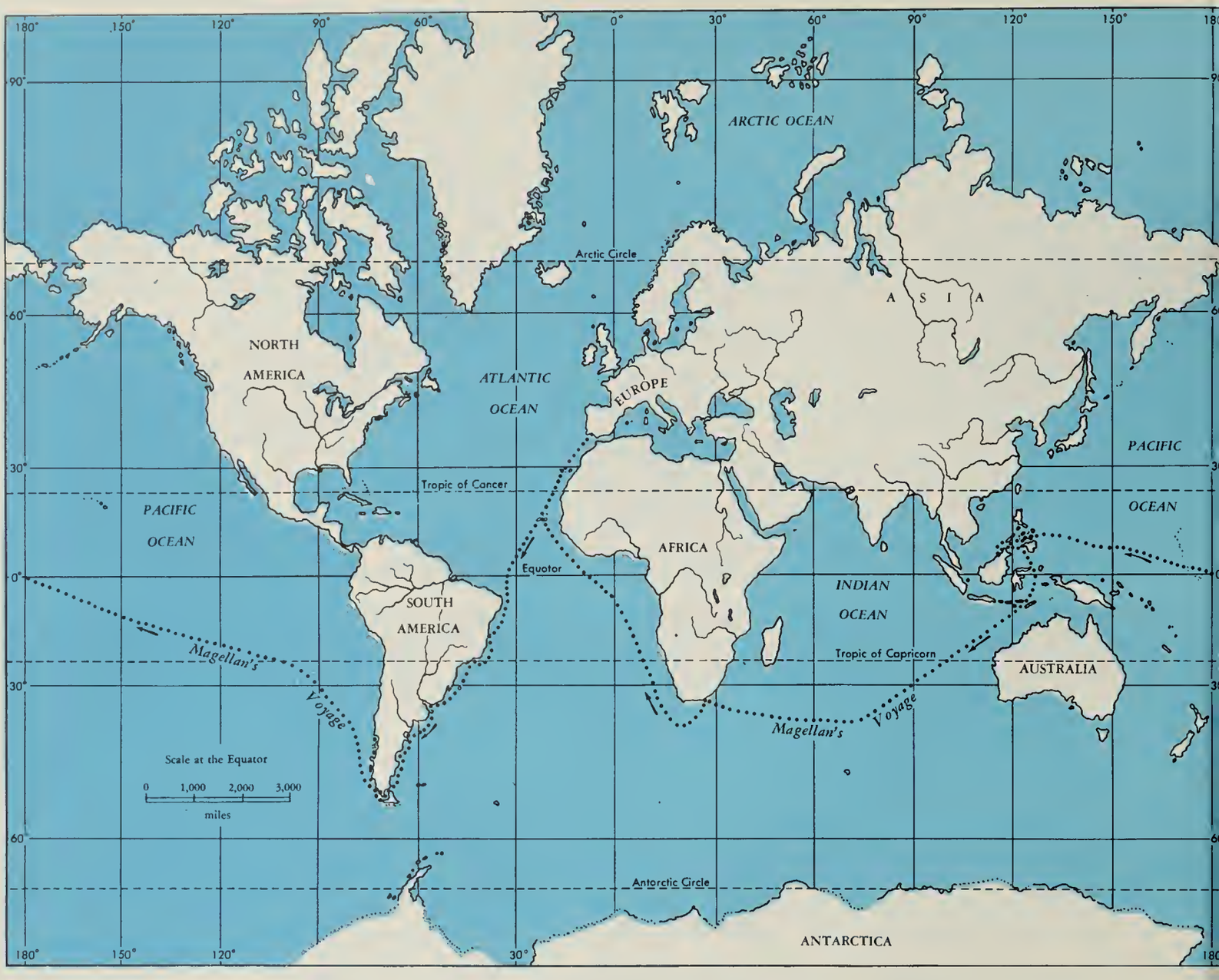
Maps of the World. In the unit on *Learning About Our World* appear a number of pictures of the globe. They do not give the exact sizes of the land and water areas, but they do give us a fair idea of what the globe shows. You remember, however, that we cannot see the whole surface of the globe at once. Yet we will often find it helpful, as we go on with our study of geography, to have a single map that shows the whole world. Many forms of maps have been designed to show the world, but always there are some measurements that are not correct.

We might put a map of the Western Hemisphere beside a map of the Eastern Hemisphere. North and South America show on the first map and Eurasia, Africa, and Australia on the second. But when we put the two parts together, you see that they touch only at the



Foto, Herbert Gehr; Copyright TIME Inc.

Here are photographs of a globe, showing it divided into halves, fourths, and eighths.
Notice how hard it is to get a connected picture of the earth.

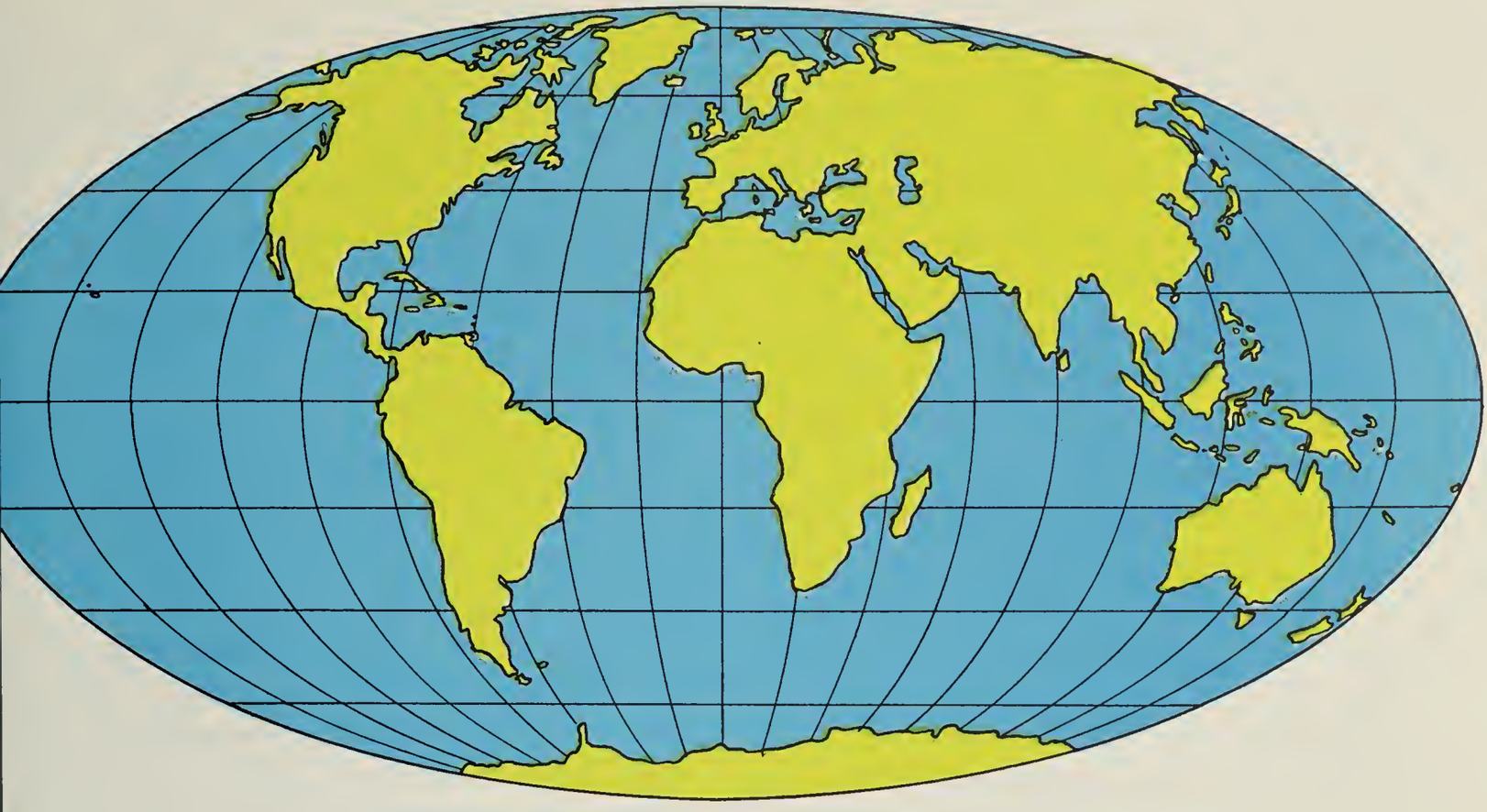


This is a Mercator Map. Shown on it in a broken line is the path taken by Magellan's ships.

Equator. Elsewhere, there is a lot of space between the two that is neither land nor water. Such a map is sometimes helpful; but we can do better.

You might think of cutting a globe from pole to pole and flattening it out. But the globe is round like a ball. You cannot flatten a ball and keep the true size of its surface. If you have an old rubber ball, cut it on one side from top to bottom. Try to unroll it. It will tear or break, and separate at many points.

In the photographs of the globe on page 19, you see how impossible it is to flatten a globe. The top figures show the globe divided into hemispheres. These halves are clearly rounded. Suppose we cut the globe into quarters, and place the parts side by side. The row of quarters begins to look like a map of the world. But each two parts touch only at one point. Elsewhere there are wide spaces. Moreover, the photographs show that the parts are still rounded. If the globe is cut into eight parts, still the parts are rounded. When the parts are lined up side-by-side, there is still much open space between them.



Compare this global map with the Mercator map.

We have had to leave it to men of science to build global maps that will really serve us. There are many kinds of such maps. We can show only two here.

The Mercator Map. The first practical world map was made nearly four hundred years ago by a man named Mercator. His map projection, as it is called, is still widely used after all these years. Study the map shown on page 20. If it were rolled up into a tube, you could make the left side meet the right side and have a closed tubelike surface.

On the Mercator map, distances measured along the Equator are entirely correct. North and south of the Equator, land and sea surfaces are larger than they should be. The farther from the Equator they are, the larger they become. Compare the shape of North America in the Mercator map with its shape on the globe. Notice that the Mercator maps do not show the poles as points.

Strange to say, air pilots and sea captains find this map useful in laying out their course in the air or on the sea. They use other maps as well. The Mercator is a simple map on which to show routes of travel from country to country around the world. Notice the travel line in this map, showing the voyage of Magellan's ships around the world. In this book, we shall take imaginary trips to many parts of the world. We can easily show our travels on a Mercator map.

Another Global Map. The map on this page makes us think both of the globe and of the Mercator map. It shows the true shapes of the continents far more closely than does the Mercator map. It cannot be used by seamen or air pilots to plot their courses. It can be used, however, for many other purposes.

Parallels and Meridians. Do you remember the five imaginary lines which you studied on the globe? Name them. In

addition to these lines, there are two groups of lines which are very helpful in the study of geography. They are the *parallels of latitude* and the *meridians of longitude.*

The Parallels of Latitude. Look on your globe or map for lines running around the earth above and below the Equator. These are parallels of latitude. Perhaps you can find one such line north of the Equator, marked 30°. This means that every part of the line is 30 degrees north of the Equator. This is the 30° parallel, north latitude. There are 90 degrees from the Equator to each pole. The parallels are numbered north and south from the Equator. Only a few are shown.

Find the 60° parallel, north latitude. Is the 60° parallel nearer the Equator than the 30° parallel, or is it farther north? One of two cities is on parallel 45°, north latitude. Another city is on parallel 30°, south latitude. Which city is nearer the Equator?

The Meridians of Longitude. Again turn to the globe and find another group of lines. These run around the earth and through both poles. These are the meridians. They are numbered in degrees east and west from a 0° meridian. You will be sure to find the numbering where meridians cross the Equator. There are 180 degrees of west longitude and 180 degrees of east longitude. Find 60° west longitude. Would you say that North America is farther east than South America, or that it is farther west?

Look at the Mercator map. You will notice that the parallels and meridians appear as straight lines. In most other maps, they appear as curved lines.

Locating Points on the Earth's Surface. We can locate any spot on the earth's surface by means of parallels and meridians. Let us take a simple case. A ship, battered by a storm, is in danger of sinking. By means of instruments, its officers find that the ship is at parallel 30° north latitude and 60° west longitude. Locate the crossing point of these two lines. In what ocean is the ship?

The captain sends out a call for help by radio, giving this position. Other ships "pick up" the signal. Those near enough to help, head at once for the sinking ship. Probably they arrive in time to save passengers and crew. This is only one of many uses of these imaginary lines.

QUIZ QUESTIONS

1. What are the advantages of a globe? Of a map?
2. What are the disadvantages of a globe? Of a map?
3. What color is commonly used on globes and maps to represent water?
4. Name the map symbols for: a mountain, a railroad, a river, a highway, and a town. Draw these symbols on the blackboard.
5. Tell two ways in which a scale is shown on a map.
6. In what different ways are towns and cities shown on a map?
7. Here are two scales: 1 in. = 1 mi. and 1 in. = 20 mi. Which scale is large enough to show the main streets of a city?
8. Name four everyday uses of maps.
9. How can you find the distance from one point to another on a road map?
10. Can a flat map of the earth be made by unrolling the surface of a globe? Explain your answer.
11. Name a world map projection which has been in use for many, many years.
12. What is a degree, as used on a map or globe?
13. What is a parallel of latitude?
14. From what imaginary line are parallels measured?
15. What is a meridian?
16. From what imaginary line are meridians measured?

A MAP EXERCISE

1. Get a road map of your own state. Locate your home town or village. If you live in the country, locate the nearest city or town.
   a. How far away is the state capital? What road or roads would you take to reach it?
   b. Is any lake shown on the map? About how far is it from your house?
   c. Find a United States highway which runs through your state. See if you can find how many miles it runs across the state. Name four towns or cities it passes through.

SUGGESTED ACTIVITIES

1. An orange is shaped almost like the earth. Get an orange. Peel, and try to flatten the skin on your desk top. What happens?
2. Make a pencil map of your school yard. Use the scale 1 in. = 50 ft. You will need to know the size of the school yard.
3. The ship *Sea Spray* is sinking at north latitude 5° and west longitude 45°. The ship *Friendly,* which is at north latitude 20°, and west longitude 45°, hears her call for help and goes to her aid. About how many miles must she go? A degree of longitude equals about 70 miles.


PACIFIC OCEAN
CANADA
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITO
Victoria
Seattle
Olympia
WASHINGTON
Columbia River
Salem
OREGON
CASCADE RANGE
Snake River
Boise
IDAHO
NORTHERN ROCKY MTS.
CONTINENTAL DIVIDE
Missouri River
MONTANA
Helena
Regina
NORTH DAKOTA
Bismarck
YELLOWSTONE NATIONAL PARK
SOUTH DAKOTA
Pierre
WYOMING
Cheyenne
NEBRASKA
Great Salt Lake
Salt Lake City
NEVADA
Carson City
Sacramento
San Francisco
CALIFORNIA
SIERRA NEVADA
UTAH
SOUTHERN ROCKY MTS.
Denver
COLORADO
Arkansas River
KANS
Colorado River
CONTINENTAL DIVIDE
Santa Fe
Rio Grande
NEW MEXICO
ARIZONA
Los Angeles
San Diego
Phoenix
MEXICO
OKI
Oklahoma
Fort Wor
TEXA
Aust
San Antonio
Rio Grande
45°
40°
35°
30°
120°
ALASKA
0 200 400
Scale 400 miles to one inch
70°
U.S.S.R.
BERING STRAIT
Yukon River
Fairbanks
Anchorage
Juneau
CANADA
60°
170°
160°
150°
140°
HAWAII
0 100 200
200 miles to one inch
160°
KAUAI
NIIHAU
OAHU
Honolulu
MOLOKAI
LANAI
MAUI
KAHOOLAWE
20°
HAWAII
155°

THE UNITED STATES

Lambert Conformal Conic Projection

National capitals
State or Provincial Capitals
Cities over 1,000,000
Cities under 1,000,000

0 200 400

Scale 200 miles to one inch

Continental Boundary
International Boundary
State or Provincial Boundary

Western Pacific R.R.

Men have cut tunnels through mountains and built bridges over rivers to make traveling easier.

Unit III

TRAVEL BY LAND, SEA, AND AIR

Presently, you are going to follow two children on their trip across our United States. Later you will have glimpses of many other lands around the world. If you really visited these countries, you would probably travel in many different ways.

Of course, travel by modern means is easier, safer, and much faster than it used to be. Yet in some places you will find people traveling today much as others did hundreds or even thousands of years ago.

Where means of travel have improved, increasing numbers of people journey within and outside of their own country. Because of splendid means of transportation, enormous quantities of goods are shipped all over our own land and to many countries of the world. Good means of transportation help to make a country strong. Before going on our trips, suppose we see how means of travel and transportation came to be what they are today.

LAND TRAVEL

How Have You Traveled? Do you walk to school or do you go in a school bus? Have you ever been on a hike with a pack on your back? Did you ever train your dog to pull you on a sled in winter? Have you learned to use skis or snowshoes? Can you skate on ice skates? Have you ridden horseback or in a car-

riage or wagon drawn by horses? Have you taken a trip on an express train? Have your parents ever taken you on an automobile trip? These are some ways of travel on land. If you have walked from one place to another and if you have ridden in an automobile, you have used the very earliest and the very latest means of travel on land.

Travel on Foot. Long, long ago all land travel was on foot. In the early days, as nations grew larger, men were trained to run long distances. Rulers or generals used these "runners" to carry messages. At first these messengers were told what to say. When they reached the persons to whom they were sent, they repeated the messages given them. When more people learned to read and write, written messages were delivered by these runners. Today, anyone may send a letter by train or air to almost any part of the world.

In very early days, if a man wished to move goods, he carried them on his head or in a pack on his back. When people began to trade with one another, goods were carried in these ways. Travelers and hunters, going through the wilder parts of the continent of Africa, still hire "porters" to carry their supplies. It takes many men to carry the goods that could be carried faster on a modern truck on a good highway. In some parts of the world, men and women still carry heavy loads on their heads.

Animals and Transportation. As time went on, early people tamed some of the animals about them. The dog became a friend of man and a helper in his work. He was soon trained to help in travel and transportation. In cold regions, especially, dogs learned to pull sleds over the snow. They learned to work together in teams and so could draw fairly heavy loads. Today the Eskimos, and others who live in the cold North, use dog teams.

Another animal which has proved a willing worker from early times is the ox. The ox is a very strong animal. It moves very slowly but makes up for its lack of speed by drawing heavy loads. It lives very well on cheap, coarse food.

At first, oxen drew heavy weights, such as tree trunks, along the ground. Then they hauled drags loaded with stones or other materials. The drags were simply heavy sleds without runners. Oxen were used later to draw heavy plows or great loaded wagons. When people went west to settle new lands, their wagons, piled high with household goods, were sometimes drawn by oxen.

In the hot, dry desert lands of Asia, Africa, and Australia, the camel has long been used for travel and transportation. In fact, the peoples of these regions call this strange looking creature "the ship of the desert." Some riding camels are trained to travel fast. Slower camels carry heavy loads.

There are many other animals which man has used to carry burdens. Among these are the great, strong elephant and the speedy reindeer. But of all these animals, the horse has been most helpful. With the horse, we might include its relatives the mule, the donkey, and the burro, a small variety of the donkey.

For a long time, all these animals have been used as pack animals. That is, they carry heavy loads, or packs, strapped to their backs. The mule, a wise animal, objects when he is overloaded. He may refuse to work. The patient little burro, on the other hand, seems willing to try

H. Armstrong Roberts

In cold regions dogs are taught to work together in order to pull heavy loads across the snow.

to carry any load that is put upon him. Sometimes, in other countries, one comes upon a burro so loaded that only its head and long ears can be seen. Perhaps its master will be riding it, too, with his feet almost touching the ground.

Horses have been ridden for thousands of years. Fast horses and ponies were used when speed was necessary. Important messages were sent by swift-riding horsemen. The first regular mail and express service in our far western lands was the "Pony Express." Letters and small packages were carried by *post-riders*. A rider rode at top speed from one post, or station, to the next. There he exchanged his tired pony for a rested one. With only a few seconds delay, he was on his way again. He rode through heavy storms and often had to fight off Indians.

In regions where roads are few, horseback riding is still common. On our western plains, cowboys ride horses in driving the great herds of cattle. On the farms, many children learn to ride. In our cities and towns, many people ride horses for pleasure.

Gradually horses came to be used for many kinds of work. For hundreds of years they have drawn heavy wagons. Before trains were invented, horses drew stagecoaches which carried passengers, mail, and baggage. People used horse-drawn carriages to get about, where now many use automobiles. On the farms, horses drew the plows, harrows, and cultivators. While horses are still used on

many farms, more and more tractors are used for the same work. Automobiles and trucks have driven horses from our city streets.

The Wheel — A Great Invention. Have you ever noticed how many wheels are in use? You see them on automobiles, on railroad cars and engines, on airplanes, and on bicycles. If you visit a factory, you see many wheels in the machinery. Probably you have a bed in your home that is set on tiny wheels, or *casters,* so that it can be moved easily. The wheel is at work for us everywhere. It is one of the great inventions of the world.

These first wheels were mere round sections of tree trunks. They wore out

Philip Gendreau, N. Y.

The camel is called "the ship of the desert." Do you know why?

The tough little burro seems willing to carry any load that is put upon him.

H. Armstrong Roberts

Brown Brothers

Fast horses helped Pony Express riders deliver the mail.

quickly. Wheels made of layers of boards were a little better. Then someone thought of putting a metal strip, or *tire,* around the rim. These wheels lasted longer. Many years later, wheels with spokes took the place of solid wheels. These made possible our horse-drawn vehicles—the four-wheeled buggy of our great grandfather's day, the old canvas - covered "prairie schooner," and the stagecoach.

Have you ever seen horses helping farmers with their work? Here the animals help the farmer haul a load of hay.

Free Lance Photographers

B. & O. Railroad

"Tom Thumb," our first locomotive, is quite different from a modern diesel-electric engine.

Slowly, over many years, other improvements led to the modern bicycle and automobile wheels with their rubber tires, and to the many odd metal wheels used in machines.

The Railroad. The first steam railroad in our land ran just outside the city of Baltimore.

When this little railroad was opened, it was only thirteen miles long. This was the small beginning of one of the great railroads of our time. The rails of this little road were of wood. The first passenger coaches were tiny, boxlike cars. The earliest trains consisted of one car and one horse to draw it. Later, the little engine *Tom Thumb* was built.

Once there was a race between *Tom Thumb* and a horse, each drawing one passenger car. At first, *Tom Thumb* got far ahead. Then it broke down. But the horse kept plodding along and won the race.

Changes came fast on the railroads. The wooden rails were followed by light iron rails. The steel rails of today carry safely the heaviest trains at speeds of more than a mile a minute. The early bridges for railroads were built of wood. They were often washed away in floods or caught fire and burned. Modern railroad bridges are built of steel and rest on strong stone or concrete piers.

Early railroads were one-track roads. If trains were going in opposite directions, one could go on a siding, or short track, and wait for the other to pass. Today, the main lines of most railroads have two or more tracks. Now, trains can pass each other easily and safely.

Once, train signals were given and switches were set by hand. Now, the main track is divided into *blocks* of a few miles. Each has its signal tower. All signals and switches are set by electricity from this tower or by the train itself, as it passes over the track. Road traffic is protected by flashing lights or gates at railroad crossings. Many main highways cross under or high over the tracks.

The steam engines which followed the *Tom Thumb* were odd-looking little machines. No two were alike. They burned wood, and cinders and sparks troubled the early passengers greatly. Today, steam engines burn coal or oil. These engines are very large and powerful. They can pull trains of passenger cars or mile-long trains of freight cars at high speeds.

New kinds of powerful engines look somewhat like cars. One of these new engines is the electric engine. It takes its electric power from a wire above the track, or from a third rail beside it. The best of the new engines is the Diesel-electric. The Diesel motor is somewhat like a gasoline motor, but uses oil for fuel. It runs a machine which turns its power into electricity. This electricity then turns the drive wheels.

Have you seen or ridden in a modern long-distance passenger train? Its bright and shining cars are beautiful to see. Inside, everything is done for your comfort. Up front is the great Diesel-electric engine. Behind the engine is a baggage and express car. Perhaps a mail car follows. Then come a number of passenger coaches. Their walls are lightly tinted. Some coaches have fine paintings at each end. The windows are wide. The backs of the well-padded seats can be tilted to any angle desired. The cars are air-conditioned.

Following the coaches is the dining car. Back of the diner is a parlor car. The chairs are large and comfortable. They can be moved about, as in a living room. An extra fare is charged for

This steam engine is pulling a mile-long freight train.

N. Y. Central Railway

passengers in this car. Then come the sleeping cars. One has a passageway along one side. Through open doors you look into cheerful little rooms. Each room can be made into a bedroom at night. A following sleeper has two rows of upper and lower berths. By day, the upper berths fold up to the ceiling. The lower berth becomes a pair of seats facing each other.

At the end of the train is the observation car. The windows are very wide. The rear end is curved and largely of glass. There are restful chairs, writing desks, and racks filled with magazines. What a wonderful train, compared with the rough, dirty cars of early days!

A long-distance freight train may have as many as 100 cars. That makes a train over a mile long. There are open flat cars, closed box cars, coal cars, cattle cars, tank cars, refrigerator cars, and many others. The last car has lookout windows in the roof. This is a *caboose* where the men eat, and sleep if necessary. One man sits at the lookout windows to keep watch over the moving train.

Perhaps you notice that the freight train has cars from many railroads in different parts of our country. A car may be loaded, say with fruit, on our west coast and sent all the way to eastern markets.

The Automobile. Possibly your grandfather can remember seeing one of the earliest automobiles. At least he can remember when there were few cars and many horses on the streets. The early cars looked very different from the cars you see today. They were called "horseless carriages" with some reason, for they looked much like carriages. Instead of being drawn by horses, they were driven by an engine or motor inside the car. Now we call them automobiles. The word means "self-propelled," or "self-moved."

A few early cars were steamers. There was a little steam engine under the floor which drove the car. Some early cars were run by electric motors. The electricity was stored in batteries placed in the body of the car.

Most cars, however, were run by gasoline motors. The gasoline was turned into a gas, a few drops at a time. The gas was drawn into the motor cylinders and was exploded by an electric spark. The shock of the explosion drove the car machinery.

One of the early makers of automobiles was able to sell a good car at so low a price that many people found themselves able to buy one. Soon millions of cars were on the roads.

Before long, the cars began to look less like carriages. New car designs followed one after another until we have the beautiful and powerful streamlined cars we see today. In the cities and between cities, motor buses took the place of trolley cars. Soon motor trucks took the place of horse-drawn trucks. Truck lines began to carry freight from city to city. Many farmers began to use gasoline-driven machinery and tractors.

One result of the wide use of automobiles was a demand for good roads. City roads were often poor. Country roads could not stand heavy car travel. Deep ruts formed in rainy weather. So the building of fine paved roads began. Today it is possible to travel long distances on good roads.

Of course you know that many people are careless drivers, and many accidents

Fairchild Aerial Surveys, Inc., for N. Y. State Thruway Authority

Today's modern highways make long automobile trips easier.

occur that are not necessary. You know that roads are dangerous places for children. You can do your part in protecting yourself and other children.

Refuse to play in a street. Look *both* ways before crossing a street. Wait for a car to pass, instead of trying to run across ahead of it. If there are traffic lights, obey them absolutely. Never run out suddenly from between two parked cars. These are just a few of the cases where *you* can help to make driving safer.

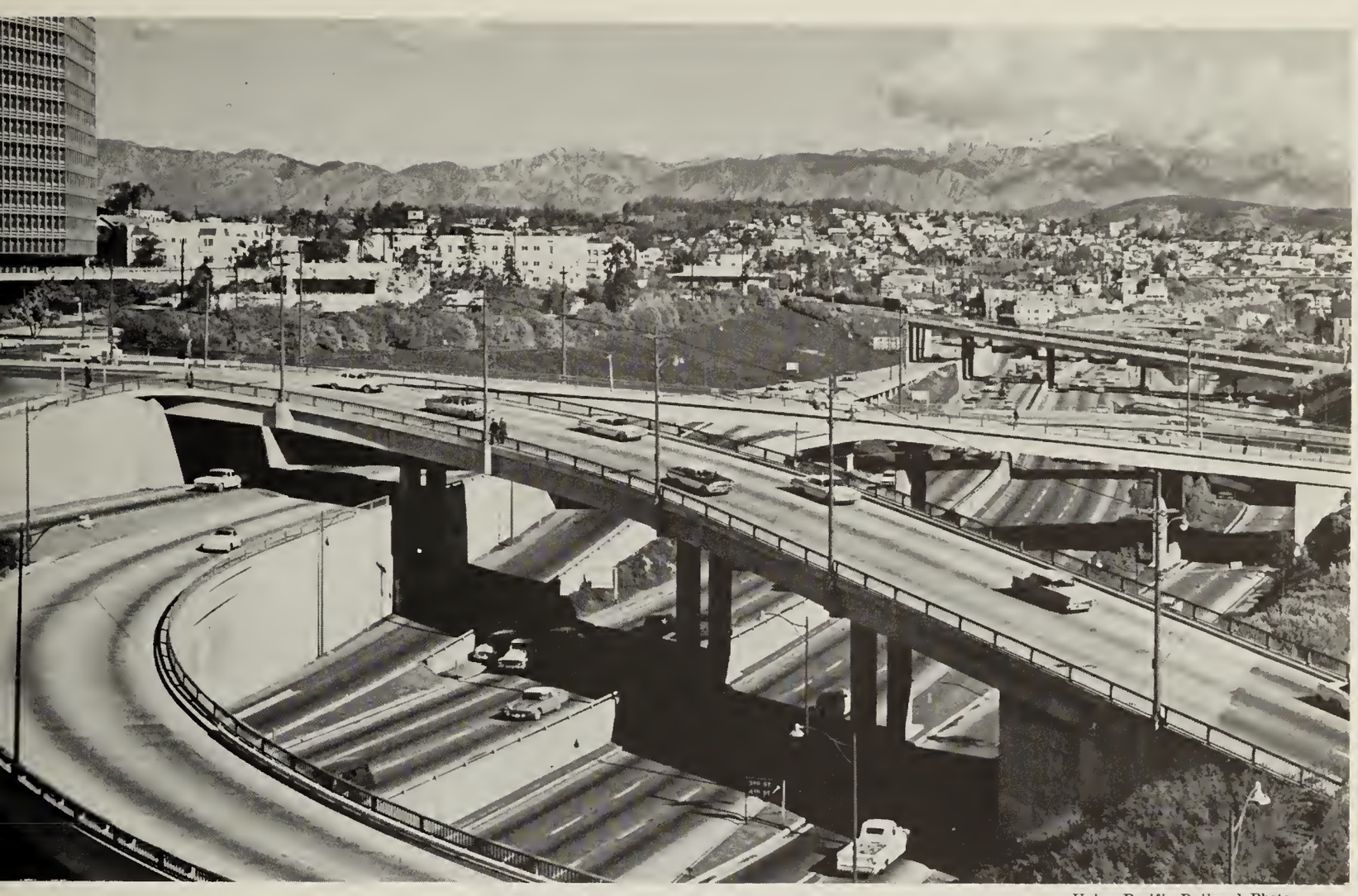
WATER TRANSPORTATION

Early Boats. The early peoples on the earth could travel by simple means. Deep streams and the open sea, however, kept them from going great distances. Many hundreds of years passed before people learned to make simple bridges across streams. Some other means of crossing wide stretches of water were needed.

Probably the earliest boat was a log floating on a stream. Someone discovered that he could sit astride a log and ride downstream. He could even paddle with his hands and guide his tree-boat. But a log rolled over easily in the water and its rider often took a ducking.

In time, men hollowed out a log and shaped the ends. This new boat, or *dugout,* was lighter. It could not roll over so easily, and it carried more people and goods. In many parts of the world, dugouts are still in use.

After a time, people learned to fasten two or more logs together to make a raft. Rafts could carry a number of peo-



Union Pacific Railroad Photo

Los Angeles thruways decrease the traffic jams of city streets.

ple or a load of goods. They could be moved upstream by shoving with poles against the river bottom. Many, many years later some of the early settlers in our country floated themselves and their household goods down or across streams on rafts. Later, they cut logs into boards and made *flatboats*. These they filled with furs and other goods and floated to market.

Many years ago, our American Indians first made light canoes from sheets of the bark of the birch tree stretched over a wood frame. A canoe was so light that a man could carry it on his shoulders from one stream to another. Indians still make and use bark canoes. Natives in other countries use the skins of animals for the same purpose. We use canoes, covered with waterproofed canvas, for sport or in hunting and fishing.

Rowboats were early used by people in many lands. They were moved by oars in place of paddles. Of course, larger boats were needed to carry people and goods across the big seas and along the ocean coasts. Many of the early ships were giant rowboats. Rows of men sat along the sides, one behind the other. Each man, or two men, side by side, pulled at a single oar. All the men had to be trained to work together. When ships became larger and had several decks, two or more rows, or banks, of oars were used, one above the other.

Sailing Ships. At first, sails were mainly used to help the rowers. Gradually, it was found that wind on the sails was the

Brown Brothers

The *Savannah*, the first steamship to cross any ocean

only power needed to drive ships. There came to be many kinds of sailing ships. They were of all sizes, too. The most beautiful and most speedy of the larger ships were the American clippers. They carried goods and passengers between our country and Asia.

Steamships and Motorships. There were some objections to sailing vessels. Winds did not always blow steadily or in the right direction. If the winds stopped, the ships stopped. During storms, vessels near land were often driven ashore and wrecked. So, when steam engines were invented, people began to think of using engines to run ships. Then winds would not matter so much.

One of the earliest steamships was the *Clermont,* built by Robert Fulton. His ship went up the Hudson River against the stream current. This was in August, 1807. The ship's engine drove paddle wheels, somewhat like the water wheels in mills. The paddles, or blades, pushed against the water and forced the ship forward.

Most early steamships had masts and sails. Thus the winds could help the engines in their task. The first steamer of this kind to cross an ocean was the *Savannah.* It sailed across the Atlantic in 1819, taking 26 days for the trip. Some of our great modern passenger steamers require only a little over four days.

Before many years passed, steamers were built of iron, and then of steel. They grew steadily larger and more powerful. The seagoing ships were

driven by *propellers.* These were on shafts that extended out under the water, at the *stern,* or rear, of the ship. On the end of the shaft were blades that looked a little like the blades of an electric fan. As they revolved, the blades pushed against the water and drove the boat on. If the ships use Diesel engines, somewhat like gasoline motors, but using oil, they are called *motorships.*

With the coming of steamships, sailing ships gradually disappeared. Modern steamships are of many kinds. There are great freighters which carry loads of every kind of goods. There are gasoline and oil tankers. The main part of the hull of these ships consists of tanks. Grain ships look much like tankers.

Finally, besides our Navy ships, there are great passenger liners. Some of these liners are almost a thousand feet long. That is as long as two or more city blocks. They have many decks. Some are for cabins, dining rooms, and entertainment rooms for the passengers. Much space is used on other decks for the crew, for kitchens, for enormous supplies of food, for freight, mail, and express, and for fuel. So far as the passengers are concerned, the ship is a great floating hotel. Any kind of food that can be purchased ashore can be ordered here. News comes over the radio. There is a ship-to-shore telephone. Messages can be sent and received. On one of these ships, you would be in touch with home and friends and with the news of the world. How different from the old sailing ships! Then, for weeks and weeks, you would have been cut off from all the world.

AIR TRAVEL

Modern trains cannot cross water, except on bridges or ferries. When high mountain peaks stand in their way, they must go around them or pass through long tunnels. Automobiles can climb

Ancient Roman warriors traveled in triremes—ships with three rows of oars.

Metro-Goldwyn Mayer

United States Lines

Great passenger liners are guided into harbors by dinghies, tugboats, and sometimes even helicopters.

steeper slopes than can trains. But, like trains, they can only cross water on bridges or ferries. Airplanes, however, can fly over high mountains and over the oceans.

From very early days, people longed to fly. They thought of their gods as able to fly. Indeed, they made pictures of some of them, showing them with wings like a bird's.

Of course, seeing birds flying easily all about them, people thought that this was the way man would fly. In flying, man was supposed to work the wings with his hands and feet. However, this just did not work out.

The Balloon. After all, it was the balloon that became the first means of air travel. The first large balloon was a great bag with a wide opening in the bottom. A fire was built under the opening and warm air filled the bag. Warm air is lighter than cool air. This caused the bag to rise.

A network of ropes over the bag supported the great basket in which passengers were carried. The first balloon went up without passengers and came down as soon as the warm air in it had cooled. The next time the balloon went up, it carried a duck, a sheep, and a goat. When they came down safely, a man tried it. He, too, came down safely. This was the beginning of air transportation.

A gas was found that was much lighter than air. So balloons could stay up longer and carry heavier loads. There was one big trouble, however. Once a balloon went up in the air, one could not

H. Armstrong Roberts

Modern harbors contain many kinds of ships. See how many different kinds you can find.

tell where the air currents would carry it.

The Airplane. As the years passed, people still wanted to fly by means of wings. Some noticed how long an eagle or a hawk could float in the air on outspread wings, without seeming to move them. Here and there a man tried building models of planes with fixed wings and no engines. They were called *gliders.* When the models floated some distance, men made gliders of large size. The first successful man-carrying glider was made years before the first airplane flight. In World War II, gliders loaded with men and material were towed by airplanes.

There are both upward and downward currents in the air. When a glider meets an upward current, it is lifted higher. It can then float slowly downward until another upward current is met. Pilots learn how to keep gliders aloft for hours and to cover long distances.

Two brothers, Wilbur and Orville Wright, became interested in flying in 1896. They learned much from gliders. Then they began work on an airplane to be driven by an engine. In 1903, this plane made its first successful flight with one man as pilot. It flew 120 feet. Measure this distance on the ground. See how short the flight was. But it was a beginning. Two years later, the brothers had learned to turn a plane in air and they made a complete turn of 24 miles. The air had been conquered.

The Wright airplane had double wings of cloth over a frame. It was very different from the great planes you see

today. But it was a start. One new style of plane followed another. Planes became stronger and more powerful. They flew much faster and carried more and more passengers. Accidents became less common.

Today, regular passenger planes have large, comfortable cabins. They carry many passengers besides their crew. Planes also carry mail, freight, and packages. All this is done on regular air routes, like railway lines, with regular stops. Air lines cross our country in every direction. You can fly across the Atlantic Ocean to Europe, or south to South America. Other planes take long hops from island to island across the Pacific Ocean to Asia.

Balloons were man's first means of air travel.

Black Star

Every large city and even many small towns have airports. Each large airport has a station much like a railroad station. An airport, first of all, is a great field, crossed by long paved strips. Some of these are like strips of highways. They run in different directions. Planes take off and land best against the wind. Therefore, different runways are used when the wind changes.

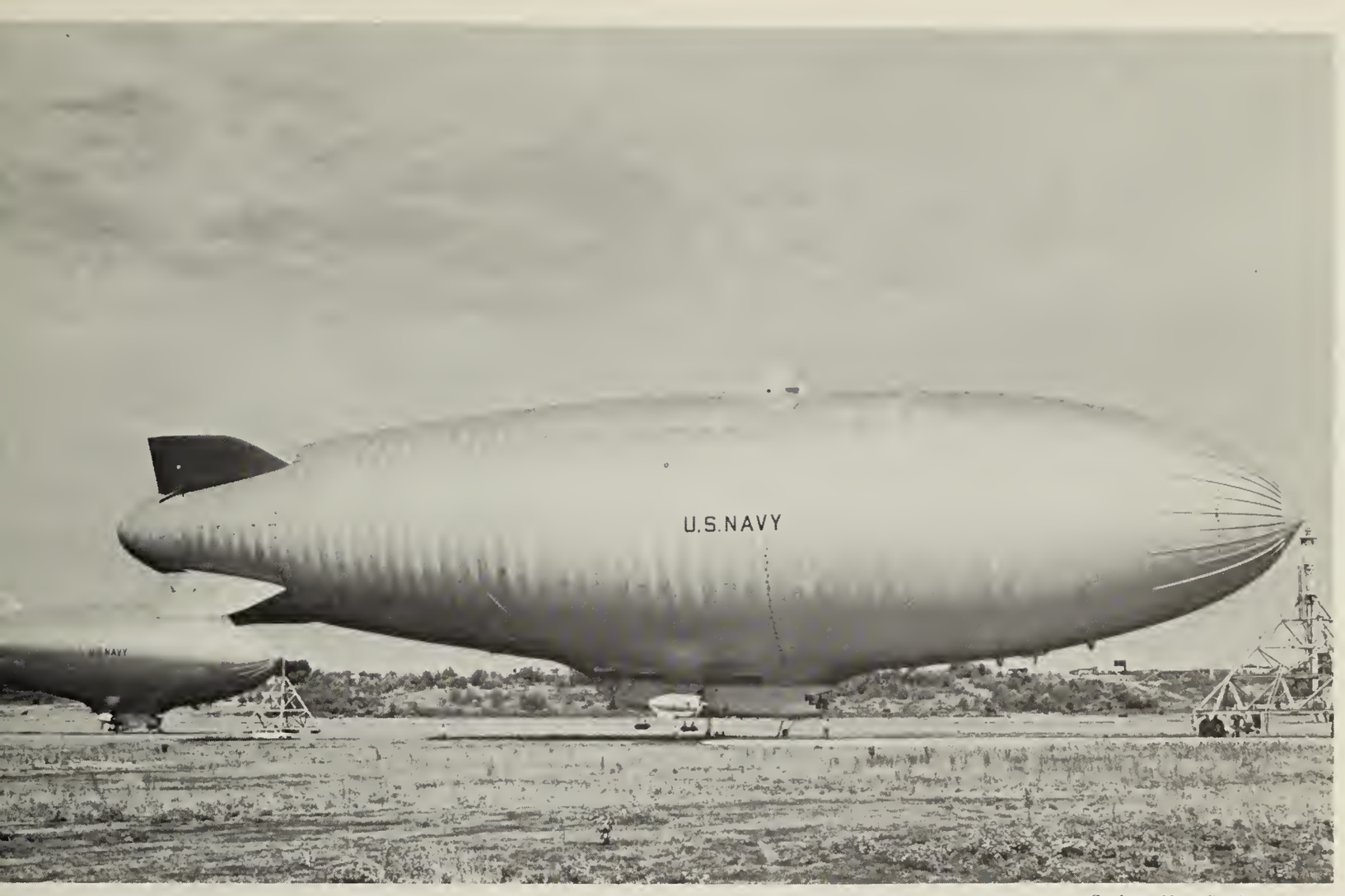
Most fields have floodlights, or broad beams of light, so that pilots can see to land. However, there is a system of signals by which planes can land even in a fog.

At each busy airport, there is a control tower where a man sits overlooking the field. By means of a radio telephone, he can talk with any pilot. No plane may land or take off without orders from him.

A large plane may have as many as six people in its crew. There is the pilot in charge, and a co-pilot to assist him. Sometimes there is a navigator, who lays out the course of the ship while in the air, and an engineer. One or two hostesses have charge of the cabin, look after the comfort of the passengers, and serve meals.

While many land planes fly the oceans, there are some lines that have used seaplanes for ocean service. The best known were the American Clippers. These planes, with boat-like hulls, could land on and take off from water.

Another kind of plane you may have seen is the *helicopter*. This is not a very large plane. It is odd-looking, for it has no real wings. Instead, over the cabin, are propellers which spin around level with the earth. The propellers lift the plane from the earth or lower it to the ground.



Goodyear News Service

The world's largest blimp was designed for air warning duties far at sea.

The captain and crew board one of our newest and fastest planes, the Boeing 707 jet.

Pan American Airlines

Pan American Airlines

Modern jet planes cross our country in a few hours.

The propellers can also be made to move the helicopter forward or backward, or to the side. However, its speed is much slower than that of an airplane.

When men began to move into the western part of our country, they traveled in wagons drawn by oxen or horses. It took them four to six months to go from the great Mississippi River to the western coast. Trains cover the distance in two days or more. Touring over the highways in automobiles and resting at night may take a week or more. Planes on regular lines take only a few hours.

Regular airline jet planes travel up to 600 miles or more an hour. Express trains average 60 miles or more an hour. Airplanes have gone around the earth in less than four days. Magellan's sailors, you remember, were three years on their trip.

Planes can now go around the world without stopping. When fuel is needed, it is taken from another plane, while both keep flying. Jet planes have flown at speeds greater than 1400 miles an hour. Planes are our fastest means of transportation. They show us great areas of land. But they usually travel so high that we cannot see the real beauty of the land and the activities of its people.

New York Airways

Helicopters transport passengers between the busy airports in New York City.

QUIZ QUESTIONS

Land Travel

1. What was the earliest way of traveling and of sending messages from one place to another?
2. How were goods first carried?
3. Name at least four kinds of animals used in transportation. Which has been most useful?
4. What was the Pony Express?
5. What ways has man found to help him carry loads?
6. In the years just before the railroads came, how did people travel?
7. Name three kinds of wheels.
8. How does a railroad "block" help make travel safer?
9. Name three kinds of railroad engines in use today.
10. How does a streamliner differ from *Tom Thumb*?
11. Why do the "through freight" trains have cars from many states?
12. Why were early automobiles called horseless carriages?
13. What three kinds of power were used to run early automobiles? What power is most used today?
14. How have automobiles brought about better roads?
15. You are going on a trip by train. Tell what the trip will be like.

Water Travel

1. How did people first travel on the water?
2. What is the difference between a dug-out and a canoe?
3. Name as many kinds of power that are used to move boats as you can. Choose one. Tell the class all you can learn about that kind of boat.
4. Compare a sailing ship and a steamship.
5. Name the first steamship to cross the Atlantic Ocean. How long did the trip take? About how long do the fastest ships take today?
6. How does a freight ship differ from a passenger ship?
7. You are going on an ocean voyage. Describe the ship you are sailing on.

Air Travel

1. What ways did man try in learning to fly?
2. Tell about the first balloon flight.
3. Compare a balloon, a glider, and an airplane.
4. Tell the story of the Wright Brothers' airplane.
5. How are passenger planes of today different from the Wright plane?
6. Describe an airport.
7. Tell about the passenger airplane and its crew.
8. What plane is designed especially for travel over water? Tell about its hull.
9. What is a helicopter?
10. Compare the speed of an express train and a passenger plane.

SUGGESTED ACTIVITIES

1. Visit a railroad station or a train.
2. Visit an ocean-going vessel if you live near the sea. Visit a river steamer if you can.
3. Visit the lake, sea, or river nearest to you.
4. Visit an airport or airplane.
5. Visit a transportation museum.
6. Start a transportation museum for your school. Build models of any kinds of vehicles that interest you. Be sure that you are able to tell about your model when visitors to the museum ask about it.

Trans World Airlines Colorphoto

To people in all the Homelands of the World, the skyline of New York is a symbol of our nation's greatness.

Unit IV

A TRIP ACROSS OUR COUNTRY

Carol and Jack Scott came home from the playground at noon, one warm July day, to find their father seated at a table in the living room. That was unusual. He was seldom able to get home for lunch.

"Hi, Dad!" they cried. "Are you taking a holiday?"

Mr. Scott grinned at them teasingly and went on studying some large sheets of paper spread out before him. He stopped to make a note in a little black book.

Jack went closer and looked down at the table. "Road maps!" he cried excitedly. "Are we going on a weekend trip, Dad? Gee! That will be great. Where to?"

Carol came running over. Her eyes took in the titles of the maps. She saw pencil marks along one red highway line.

"These maps cover the whole country. Dad, are we really—Say, are you going to take us? Oh, tell us, Dad!"

Mr. Scott leaned back in his chair and smiled up at them. "We really are," he chuckled, "and I am. You know, last year I told you I wanted to show you more of your country. Well, the chance has really come. We are going to drive all the way across our country by one highway. Then we will return by another

Brown Brothers

Cars pour into the nearly two-mile-long Holland Tunnel, which is built beneath the Hudson River.

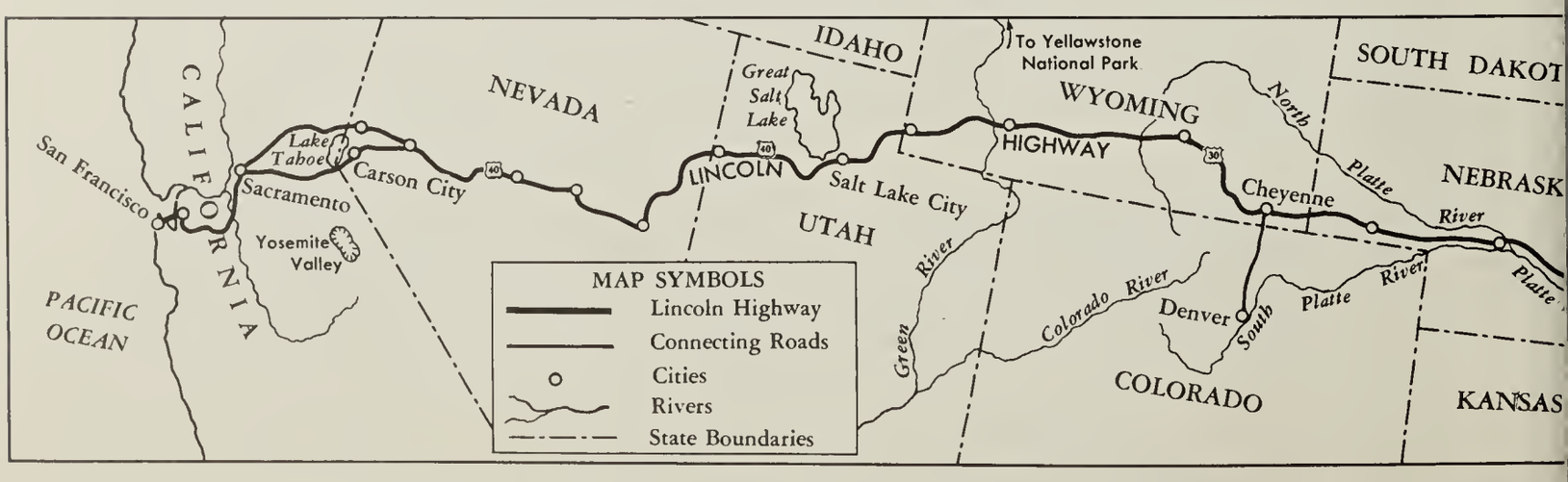
route. I haven't worked that one out yet."

When their excitement had died down a bit, Carol said, "Show us the highway we will take going west, Dad."

Mr. Scott traced with a pencil the route they would follow. "It runs, you see, from New York City, where we live, across the northern part of our country. The highway is a combination of United States routes 1, 30, and 40, and is called the Lincoln Highway. It is 3331 miles long from New York City to the city of San Francisco. If we wanted to make faster time, we could use the new turnpikes or superhighways. We might not see as much, however.

"How long will the trip take?" asked Carol.

This is a road map of the Lincoln Highway.



"Going west," replied Mr. Scott, "between two and three weeks. We will want to take short side trips."

"Wouldn't it be better to fly across and back?" asked Jack. He had a special interest in flying.

"Flying would save time and be a pleasant experience," answered his father. "But this time I want you to really see our country and its people. You can do that far better from the ground than speeding along five miles up in the air.

"We will pass through many places that were important in the history of our country. I want you to see them. You know, the first settlers lived here in the East. From here, people moved slowly westward. In a way, we shall follow their trail.

"Our country has many different kinds of land and climate. When you know them, you can understand much about the geography of other lands around the world."

"When are we to start, Dad?" asked Carol.

"Tomorrow morning," answered her father. It was like him to spring surprises on them. "Your mother has been getting ready for days."

"They're Off!" Early in the morning, the Scotts were up and away. They drove downtown and turned into the brightly lighted Holland Tunnel under the Hudson River. This is really two tunnels nearly two miles long, one for traffic going west, and one for traffic going east. The far end of the west-bound tunnel let them out in the state of New Jersey. For miles they traveled on an elevated highway over cities and by immense factories. Then they sped by farm lands and dairy farms. Finally they passed through the city of Camden and over an immense high bridge.

"We are crossing the Delaware River," said Mrs. Scott. "Right ahead lies Philadelphia, our fourth largest city."

Philadelphia. From the bridge, the children could see many factories. Mr. Scott said that sugar and candy, leather, machinery, woolen goods, clothing, carpets and rugs are some among its many manufactures. Oil is refined and ships are built. The first United States Mint is here. A *mint* is a place where coins are stamped from metal.

Mr. Scott drove along the river front, by pier after pier where many ships were unloading and loading. Some ships flew our flag. Some flew flags of other nations.

Presently they turned into a street running away from the river and stopped before a little three-story brick house with a sloping roof. A flag flew from the top window.

Follow the Scotts' progress across the country on this map.

The Continental Congress signed the Declaration of Independence in this building—Independence Hall.

H. Armstrong Roberts

"This," Mr. Scott said, "is the Betsy Ross house. Many people believe the first flag of our country, as an independent nation, was made by Betsy Ross in this house. That flag had thirteen stars for the thirteen states then in our country."

Mr. Scott drove on through the crowded business section with its great stores and high buildings. Finally, he stopped near a fine old brick building with a brick and wooden tower. They all got out and walked over to the doorway.

"This is one of our country's most famous buildings," said Mr. Scott. "This city was the first capital of our new nation. In this building the governing Congress met, and signed a Declaration or Independence. By this act, our country declared itself free from England."

They went inside and almost at once faced a large bell. It showed a ragged crack down the side towards them.

"That's the Liberty Bell," exclaimed Carol. "We've heard about that in school. It hung in the tower and was rung when the Declaration was signed on July 4, 1776, to let people know they were free." She stepped forward and read the words molded on the bell: "Proclaim Liberty Throughout all the Land unto all the Inhabitants Thereof."

After lunch they drove along miles of city streets and then on through town after town. Many of the buildings were built of stone quarried in the neighborhood. Then more and more farms appeared. The buildings were neat and well painted, the fences in order, the fields free from weeds.

The land was now more rolling. Mr. Scott said they had left the Atlantic Plain and were entering the Appalachian Highlands. In early evening, they arrived at the small city of York and stopped for the night.

In 1776 the Liberty Bell rang to let people know they were free.

H. Armstrong Roberts

Map of North America showing the United States mainland and the Lincoln Highway.

On to Pittsburgh, the Iron and Steel City. Well rested, the Scotts continued the next morning. A few miles from York, they passed through a small town and entered a beautifully-kept park with fine winding roads. Everywhere were tablets and statues, and here and there were small cannons.

"This," said Mr. Scott, "is Gettysburg Battlefield. Here, a great battle was fought between the Northern and Southern states many years ago. Now, we are united again as one nation."

Beyond Gettysburg, the hills grew steadily steeper. The ranges of the Allegheny Mountains, here running northeast and southwest, became increasingly steep. From the top of one ridge, the Scotts could see the road winding far down, then climbing up again. Streams flowed between the ridges. For miles there was little or no farm land.

At last the real highlands were left behind, although rolling lands and steep hills continued. After a late noon meal, they drove leisurely through farm lands and forests and small villages. In late afternoon, towns appeared in increasing numbers. Here and there were coal mines and limestone quarries. The valleys were full of noisy factories and iron and steel mills. Railroad tracks ran in every direction, serving the mills. Smoke hung over everything. As darkness came on, a red glow covered the sky. Flames shot up and disappeared.

"It looks like a great fire!" gasped Jack.

"Just the glow of iron and steel mills," said his father. "Part of the work never stops. Pittsburgh is called, among other things, the Iron and Steel City. Steel is iron with certain minerals added. The iron ore comes largely across Lake Erie

H. Armstrong Roberts

Mills in the Iron and Steel City continue operating throughout the night.

from other states. Coal and limestone, used in making iron and steel, are mined nearby. Much is brought to the city in barges, on two rivers that meet here and form the Ohio River. Natural gas and oil come from not far away. In the factories, iron and steel are made into many useful things, including railroad cars. More glass and glassware are made here than in any other city.

The noise from the mills, and the flaming gases, awed the children, as the car went up and down steep hills or crossed valleys. Never had they imagined anything like it. Mr. Scott stopped for the night on the heights overlooking the business city. Carol said, "Pittsburgh is all hills and valleys."

Chicago Comes Next. The next morning found the family rested and eager to go on. After a good breakfast, Mr. Scott drove down a great highway overlooking mills and factories. At its end, they passed through Pittsburgh's business section of fine stores and tall office buildings. Finally, they came to the meeting of the rivers. At this point, the Ohio River begins. At the very point stood a little blockhouse, or fort. Mr. Scott said it was built in the early days of our country for protection against Indians. Here, too, Indians once came to trade with the settlers.

After leaving Pittsburgh far behind, they crossed a high bridge over the Ohio River. The road map showed them that they were in the state of Ohio. The Scotts were making good time. As they moved westward, the land became more level. They were now

Philip D. Gendreau, N. Y.

Our second largest city has many parks and beaches.

at the eastern edge of the Central Plains. These form a wide belt of level or slightly rolling land, that crosses our country from north to south.

Mile after mile, the car rolled through fertile farm land. Crops of grain, hay, alfalfa, and soybeans grew richly. Cattle and hogs fed in different pastures. The homes and farm buildings were well kept. The villages and towns, where the farmers sold their products and bought supplies, looked prosperous. At the sidings of the railroad, the children noticed grain elevators, and wooden pens for holding stock until it was shipped away. In the larger towns were factories and mills.

Hours later, they came to a sign that told them they were entering the state of Indiana. The level land and rich farms continued. At last, in late afternoon, Mr. Scott turned in at a farm gate where a sign said, "Guest Rooms for Tourists." The large white farmhouse was a pleasant one, and the Scotts liked the people who owned it. Jack and Carol made friends with the children of the family. Soon all were off looking at the farm pets, while waiting for the evening meal.

Carol and Jack would have liked to stay over the next day. By now, however, they were realizing that our land is very large. The road maps showed that they had a long, long way to go.

They had not traveled very far before they knew they were approaching another large city. The towns were closer and closer together. They passed more and more great factory buildings and crossed many railroads. The highway became crowded with cars and trucks.

"Why, Dad!" cried Jack suddenly, "You've jumped the track. We're not on the Lincoln Highway."

"I wondered when you would discover that," laughed his father. "We left the highway a few miles back. It does not run into Chicago. However, I want you to see the city. It is the second largest

city in our country and is our greatest railroad and airport center. It is on one of the Great Lakes and is a port where thousands of ships dock each year. Chicago has iron and steel mills, and it manufactures many articles. It is also the largest meat-packing city in the world. The meat of cattle, sheep, and hogs prepared here is shipped all over the world. The city is also the greatest grain center in the world. Yet it is a far younger city than New York or Philadelphia."

Mr. Scott drove through steadily thickening traffic into the business center of the city, called the Loop. He said there were subways under the Loop, for passengers and for goods. Thus freight cars could reach the great stores. Once he was held up at a river crossing to let a steamer pass. The children stared at the lift bridge, which was divided in the middle. Each half swung up into the air on a sort of rocker built at each pier.

When the bridge swung down, Mr. Scott went on to the shore of Lake Michigan. He drove down a beautiful highway near the shore. Great hotels and other buildings lined one side. On the other side were parks and one or two public buildings. Breakwaters, built out into the lake, protected small harbors. A strong breeze off the water sent waves crashing against the breakwaters. Spray flew high in the air.

"It looks almost like the ocean," exclaimed Carol. "I can't see the other shore."

"The lake is about three hundred miles long and nearly one hundred and twenty miles wide," said Mr. Scott.

Mr. Scott drove by huge grain elevators, in which wheat and other grains

The halves of one of Chicago's many bridges swing upward to let a boat pass.

Keystone View Company

Philip Gendreau, N. Y.

Meat from cattle, sheep, and hogs is shipped all over the world from the stockyards in Chicago.

are stored. They passed docks loaded with iron ore. Great ore ships, as large as ocean tankers, were unloading their cargoes.

Of course, the tour included the immense meat-packing plants and the stockyards. As far as one could see, there were rows of yards, enclosed by high fences. Between the rows were lanes, through which the livestock could be driven. Never had the children seen so many thousands of cattle and sheep and hogs.

From Chicago to Omaha. From the stockyards, Mr. Scott drove back to the Lincoln Highway and sped across the state of Illinois. Soon they were passing another rich farming region. They saw much more corn and soybeans growing here. Mr. Scott told them that more soybeans were grown each year. He said they are a rich food, but are largely grown for their oil, which has many uses in manufacturing.

In many pastures, cattle or hogs were being fattened. Everywhere, too, were large dairy farms. If they had gone farther south in the state, Mr. Scott told them, they would have passed through regions where there were coal mines and oil wells.

Just as the sun was setting, they crossed the Mississippi River.

"Why, it's not as big a river as the Ohio," said Jack in disgust. "I always thought it was a whopper!"

"It grows big enough farther down," laughed Mr. Scott, "after the Ohio and other streams flow into it. Wait until we

Des Moines, Iowa, Chamber of Commerce

Corn, Iowa's most important crop, is ready for drying in one operation with this modern equipment.

see it later. Now," he went on, "we are in Iowa. You will see more corn growing here than any other crop."

The Scotts stopped overnight at a motel. The next day, they moved rapidly across the level farm lands of Iowa. Corn, indeed, grew richly on every farm, besides other familiar crops. Mr. Scott said that much of this corn was used to fatten cattle and hogs.

Late in the afternoon, after crossing the big Missouri River, they stopped for the night at Omaha, in the state of Nebraska. The next morning they had time to see that Omaha is a great meat-packing and grain center, and an important railroad center. Immense flour mills, canning factories, and a large lead mill were seen.

Westward Ho! Moving steadily westward out of Omaha, the Scotts passed quickly by fields of grain, and of many vegetables grown for the canneries. Presently the highway drew near a wide and shallow river, the Platte. All day long, they followed it.

"It makes me think of my great-grandfather," said Mrs. Scott. "He was one of the settlers of the West. When he followed a trail along this river, it was all wild land. This land is called *prairie.* It was covered with thick grass and blooming flowers. More buffaloes than you could count roamed these plains in

Caterpillar Tractor Company

In the Great Plains, large white sugar beets are grown in great quantities.

great herds. It sometimes took hours for a herd to pass a single point.

"There were savage Indian tribes that hunted the buffaloes for food. They made clothes of the hides, and skins to cover their tents. The Indians often attacked the covered-wagon trains. My great-grandfather was attacked at the Platte River. I wish I knew the spot."

"Gee! I wish I'd been there," cried Jack.

"I think this is a lot better," laughed Carol. "But, Mother, what did the settlers do for lumber? We haven't passed any forests in an age. The only trees seem to be along the streams."

"That's right," said her mother. "The word 'prairie' means grasslands with almost no trees. The prairie sod is very thick and tough; so tough, the settlers found it hard to plow. The men cut blocks of sod and used them to build the walls of their huts, just as we use bricks or stone blocks."

"I notice something else," said Carol. "The land is not so level. It sort of rolls up and down."

"Good girl!" laughed her father. "I am glad you keep your eyes open. We are now in the Great Plains, a belt of land, like the Central Plains, that runs north and south through our country. It is a tilted area. The whole plain slopes upward towards the west. Before long, we shall be as high above the level of the sea as the tops of the highest mountains in the East."

As they traveled west, the soil grew drier and sandy. The wind blew hard. When the highway turned off from the Platte River, they passed great fields of plants that Jack thought looked like giant beets.

Screen Traveler, From Gendreau, N. Y.

Cowboys tend large herds of cattle on the ranches of the Great Plains.

"They are beets—sugar beets," Mr. Scott told him. "The beets grow very large and are white in color. They are cut up and passed through tanks of warm water. The water takes up the sugar juices. This juice is made into sugar. The sugar tastes just like the sugar from sugar cane.

The Scotts spent the night at one of the sugar-beet farms. The next day, crossing into the state of Wyoming, they found sugar beets a popular crop. They learned that here most farm crops are raised in fertile valleys, irrigated by mountain streams. Now and then, ranches appeared. The children stared eagerly at the cowboys who were handling horses and cattle. Once they passed a "dude" ranch. People came here for vacations and to see something of ranch life.

After a time, they went through the small city of Cheyenne, the state capital. Outside the city were gas and oil wells. While resting after lunch, Mr. Scott talked with a mine owner. The man said, "The state has rich beds of soft coal, and large quantities of iron ore and other metals. The mountain streams supply electric power. Sheep and cattle raising is a great ranch industry."

The scenery, as they drove on, was very beautiful. Some of the distant mountain peaks glittered with snow. At one point, Mr. Scott stopped the car and read a road sign. "We are at the Divide at the top of the Rocky Mountains," he said. "Here, streams flow in different directions. Those on the eastern slopes

Chicago, Milwaukee, & St. Paul Railroad

Old Faithful spouts every sixty-five minutes.

flow eastward toward the Gulf of Mexico and the Atlantic Ocean. Those on the other slope flow westward to the Pacific Ocean."

In the late afternoon they stopped at a small town, from which a highway led north. "Here we leave the Lincoln Highway and go north," said Mr. Scott. "We will come back later. Suppose we stop here for the night."

Carol had been following their trip on the road map. "We're going to the Yellowstone Park!" she cried.

"Yippee!" yelped Jack.

The Yellowstone National Park. "I'll never forget this part of the trip," said Carol, after they were well on their way. The others agreed. The scenery was grand. The mountains grew ever taller and more rugged. Signs told of points where old forts or stage stations and trading posts had stood. All began to realize the hardships of the early settlers who struggled over these mountains. Then there had been no real roads, no bridges, and dangers were at every hand.

The Yellowstone National Park, they discovered, is a wonderland of beauty and of strange sights. It is larger than our two smallest states put together. Fine roads help visitors to see every part. The forests have never been cut, and wild animals live undisturbed.

In their two days at the park, the children saw many unusual things. They talked about them for some days thereafter. They saw the beautiful Yellowstone Lake, on a high plain, or plateau, nearly 8000 feet above sea level. Rugged mountain peaks surrounded it. They saw the roaring river that flowed from it. It flowed through a deep gorge, or *canyon,* whose walls were brilliant with many different colors. They gazed at the lovely, spraying falls where the river leaped off the cliffs. There was one straight drop of over 300 feet.

Carol and Jack were especially interested in Geyser Basin. Here, over one hundred geysers, or spouting springs, from time to time shoot water into the air. Some little ones spout tiny jets only four or five feet high. The giant geysers shoot masses of water directly upward for about 75 to 250 feet. The children liked "Old Faithful", a great geyser that could be depended upon to spout about every 65 minutes. In the same region were springs of boiling water. Other pools, underground, roared and growled under their feet. There were the "paint pots" too. These were springs filled with mud of many bright colors.

It was later in the day. They had been driving through wonderful forests. Suddenly a wide grassy plain appeared ahead of them. "Look!" cried Jack. "Buffaloes!" There they were, hundreds of the dark brown creatures! Some gazed toward them. Some were grazing. A few calves were scampering about. A giant bull stood guard at one side.

This turned out to be an animal day. Later, the children spotted a beaver dam across a stream. The beavers were at work on it. Farther on, herds of deer and elk were grazing. Once, Jack glimpsed a great head in the underbrush. It had

State Highway Commission, Pierre, S. D.

Large herds of buffalo used to roam this country.
Why did so many disappear?

Grizzly and black bears live in a natural forest setting in Yellowstone National Park.

Brown Brothers

Union Pacific Railroad Colorphoto

Yellowstone Falls. Do you know the names of any other famous waterfalls?

Black Star

Swimming is easy in the Great Salt Lake, where the water is heavy with salt.

immense horns with broad, flat branches. Before Jack could point it out, the animal turned and crashed away through the woods.

"That must have been a moose," said Mr. Scott.

Later, they stopped beside a uniformed forest ranger to ask directions. The man was looking through his glasses at a distant mountain slope. "Want to see some mountain sheep?" he asked, offering the glasses. The children could make out white creatures moving single file, high up the slope.

Best of all, they saw some bears feeding, some distance away. Some of the grizzlies were very large. Others were of all sizes down to small cubs. At one side, were a few black bears. If any of these edged too near the grizzlies, warning growls made them back away.

"See!" exclaimed Carol. "Those grizzlies won't let the black bears eat anything until they are through."

In Desert Lands. It was hard to leave the park the next day. On the way back to the Lincoln Highway, Mr. Scott drove by a smaller park, where saw-tooth mountain tops towered high beyond a beautiful lake. Mountains lined the highway for many miles. But towards the end of the day's trip, the road dipped down to a plain. Ahead of them, they saw a city on the shore of a very large lake.

"We're in the State of Utah, now," said Mr. Scott. "That is the Great Salt Lake. Its water is so heavy with salt that anyone can easily float in it. The city you

Caterpillar Tractor Company

In Utah, a state rich in minerals, is the world's largest open pit copper mine.

see is Salt Lake City. The gardens and fields look rich. That is because they get water by irrigation from mountain streams. Splendid crops are raised in the state by this means. Utah is a very great mining state. Large quantities of copper, iron, silver, gold, lead, and coal are mined here."

"Can't we visit a mine, Dad?" asked Jack.

"I'll think about it," said Mr. Scott.

"That means, Dad, that you've already planned to do it," laughed Carol.

They stopped for the night in the city. It had beautiful parks, wide streets, and many fine buildings. In the evening, Mr. Scott took them to Saltair Beach, where they had a chance to float in the bracing water.

The next morning, Mr. Scott was in a great hurry to get started. Outside the city, he drove down a side road to the world's largest open-pit copper mine. The mine was an enormous pit. On the sides of this pit, sloping shelves had been cut in the ore. Trains laden with ore struggled up out of the mine over tracks laid on these shelves.

Mr. Scott wasted no time. Soon they were back on the highway, rolling through a desolate land. Low ridges of bare rock rose here and there, with sandy stretches between. There was little plant growth of any kind. It was broiling hot. Mr. Scott had a big can of water for drinking and for use in his car radiator. Hour after hour, they rolled over the great desert. For miles and miles, it was as flat as a table.

"Think what it must have been for the settlers on their way to California in their slow wagon trains," said Mr. Scott. "Their horses and oxen, and even some of the people, died from the heat and lack of drinking water."

"What makes it so dry here?" asked Carol.

"The mountains to the west are so high they shut off the rain clouds," said Mr. Scott. "When we get farther along, we will go over mountains whose slopes on this side are bare. On the western slopes, there are forests."

They reached the first mountains and rode up out of the valley heat. The next morning, after more climbing, many streams appeared, and the valleys became green and wooded. They were now in Nevada. Though one of our largest states, it has comparatively few people. All day they passed ranches with great herds of cattle. In some of the valleys, they saw equally large herds of sheep. The scenery was beautiful. At one point, a great forest park bordered the road. They passed over a few stretches of desert land.

Once, a group of horsemen broke out of a side trail. They rode bareback, with only a strap around their horses' noses. "Indians!" gasped Jack, and stared open-mouthed. One of the Indians lifted an arm in greeting, and Mr. Scott returned the salute.

That night the Scotts secured shelter at a ranch. They dined with the ranch

The high mountains in the background keep most rain clouds from reaching this desert.

Philip Gendreau, N. Y.

Philip D. Gendreau, N. Y.

After miles of dry desert land, beautiful Lake Tahoe is a refreshing surprise.

force. Jack and Carol could hardly eat, they had so many questions to ask the cowboys. They hated to leave when morning came. Early that day, they passed through the small city of Reno and presently reached another state line.

"California!" cried Carol. "How soon will we see the Pacific Ocean, Dad?"

"There are more mountains to cross first," laughed her father, "but no more desert land. California is a rich and beautiful state. The first large groups of settlers struggled across the plains and mountains about a hundred years ago. They did not seek rich farm lands, but the gold that had just been discovered here. California is called the Golden State."

Within a few miles, they had a distant view of Lake Tahoe, one of the loveliest lakes in all the world. Soon they rode through a high mountain pass. Then they dropped gradually down to the valley of the Sacramento River through forest areas and rich farm lands. Familiar farm crops reappeared. There were also wonderful farms where blooming flowers gave brilliant colors to the land, and fragrance filled the air. "Many of the flower seeds we use in our home gardens are grown here," Mr. Scott said.

The Golden Gate City. During the next few days, the Scotts took many interesting trips around the city. They visited Chinatown, the largest Chinese settlement in our part of the world. Jack and Carol especially liked their exciting ride on a cable car—a special kind of street car used to travel up and down the city's

many steep hills. They had a delicious dinner at Fisherman's Wharf, right out on the docks that are the "home" of San Francisco's big fishing fleet. Along the waterfront they saw ships from many nations. In many ways San Francisco forms a link between our nation and the lands which lie across the Pacific.

One evening the Scotts were relaxing in their hotel lobby. Mr. Scott said, "If we had visited this state earlier, then we would now be in our most western state of the Union."

"Yes, Dad," Jack replied, "but since Alaska and Hawaii have been made states, we can no longer say that."

Carol jokingly added, "Let's keep traveling and visit our newest states in the Union."

Juneau, Alaska's capital, looks as if it might be pushed into the water by the mountains.

Alaska Division of Tourist and Economic Development

Just then, a boy who had been listening to the family talking, proudly said, "My dad and I just returned from a visit to Alaska and Hawaii. We had a wonderful time."

Alaska, Our Northern State. Though the boy and his father had been able to visit only the southern and western parts of Alaska, they learned much about our largest state. Traveling from Juneau, Alaska's capital, they saw that the state was rich in natural resources. They watched the salmon fleets bring in their valuable catch. They caught glimpses of the wild life that attracts fur trappers and sportsmen from all over the world. They admired snow-capped Mt. McKinley, the highest mountain in North America.

A stewardess on one of the airplanes told them about Alaska's air bases and radar stations, explaining that United States defense was a very important job for the people of Alaska. Almost half the people in the state work on defense projects or communications.

"While we were in Nome," the boy said, "we walked along the fishing docks. My father pointed across the water. He told me that just 54 miles across the Bering Strait was Russia!"

Hawaii, Our Island State. Carol had enjoyed hearing about Alaska, but was anxious to find out about our newest state. "What about Hawaii?" she asked. "Did you go there from Alaska by boat?"

"No, Dad was in a hurry, so we took a jet," the boy replied. "We made Honolulu in just five hours. You know, it's no wonder so many people go there for vacations. The weather is wonderful all year round."

Although the boy and his father were

Dole Photo

Hawaiian farmers carefully pluck fruit from the center of the pineapple plant.

there only a short time, they had learned much from talking to people. The boy learned that the 20 Hawaiian islands are really the worn-down tops of great volcanoes which were raised from the bottom of the ocean millions of years ago. The lava that has flowed from these volcanoes makes the soil rich and fertile. The main crops are sugar cane and pineapple.

"I was there when the volcano Kilauea shot lava high into the air," the boy said. "The hot lava spread down the island of Hawaii toward the ocean, destroying the village of Kapoho on the way."

The boy met many Japanese people on the islands. Over a third of the people are Japanese. Many nationalities live in Hawaii. Some of these are Chinese, Filipinos, Koreans, and Americans, along with the native Hawaiians.

He visited some of the U. S. naval and air bases on the 8 largest islands which make up the state of Hawaii. These bases are important because they are links between the U. S. mainland and Asia.

"But the part I liked best was going out to dinner. The food is lots different from what we have at home. We ate all kinds of green leaves and meat with delicious fruits for dessert. Women wearing brightly colored costumes with flowers around their necks danced while we ate," he added.

Mr. Scott said, "Well, I can see we're going to have to include Alaska and Hawaii in our next trip. Right now, though, we'd better start thinking about our trip back from San Francisco to New York."

QUIZ QUESTIONS

1. Between what cities does the Lincoln Highway run?
2. In starting the trip, how did the Scotts get into the state of New Jersey?
3. What river did they cross to reach Pennsylvania?
4. At what great city did they first stop?
5. Name three kinds of goods made in Philadelphia.
6. Tell about Independence Hall.
7. Going west from Philadelphia, what mountains are crossed?
8. What great city is next reached? For what is it especially noted?
9. What large river starts at Pittsburgh? How is it formed?
10. Beginning in Ohio, what great belt of land is crossed by the Lincoln Highway?
11. What are several common crops in this belt of land?
12. Is Philadelphia or Chicago the larger city?
13. Name five things that help make Chicago a great city.
14. On what great lake is Chicago located?
15. What are three great crops of the Central Plains?
16. Why do you suppose so many cattle, sheep, and hogs are fattened on the farms of the Central Plains?
17. Name three large industries in Omaha, Nebraska.
18. What great belt of land lies west of the Central Plains? In what ways is it different from the Central Plains?
19. What animal used to roam these regions in almost countless numbers?
20. From what crop in the Great Plains is sugar made?
21. What is a divide?
22. Name four interesting sights in Yellowstone National Park.
23. What large lake in Utah gives its name to a city? What is unusual about the lake?
24. What is an open pit mine?
25. Describe the land immediately west of Great Salt Lake.
26. Why is there little rain in this desert?
27. What state is a great ranch state?
28. Why was travel westward so hard for the early settlers?
29. Why is California called the Golden State?
30. Tell about farming in the Sacramento Valley.
31. What do you remember about the city of San Francisco?
32. Have you read any interesting stories about Alaska and Hawaii?

SUGGESTED ACTIVITY

Use Your Imagination

Imagine you have visited with the twins the places at which they stopped or passed through on their trip to the west coast. Describe each part of the trip so well that the rest of the class can give its name without your telling them.

Union Pacific Railroad Colorphoto

Mirror Lake, Yosemite National Park. Why is it called "Mirror" Lake?

Ewing Galloway, N. Y.

Each full-grown tree is big enough to supply lumber for a house.

Unit V

FROM WEST TO EAST THROUGH THE SOUTH

The Scotts were starting from San Francisco on their long trip homeward.

"I suppose," said Jack, "that we'll see about the same things we saw coming west."

Carol caught the twinkle in her father's eyes. "You have new sights to show us, haven't you, Dad?" Carol asked, but all he would answer was, "Wait and see."

Waterfalls and Big Trees. They had left San Francisco in cool, foggy weather. Beyond the lovely Sacramento Valley, hills and mountains caused the highway to twist and turn and climb steeply. By noon they passed a sign that read YOSEMITE NATIONAL PARK.

What they saw in the park was a wonderland of beauty. They drove for eight miles up a valley which had been carved by glaciers ages ago. The valley was like a great highway. It was lined, not by tall office buildings, but by towering cliffs of glittering rock. The air was filled with the sound of rushing streams. From the fringe of mountains dropped waterfalls. The Bridal Veil Falls fell over 600 feet, almost dissolving in mist and spray. Later in the day the Yosemite Falls held them spellbound. The upper fall alone was over 1400 feet high. All about were fields of ferns, and of colorful lilies and other blooming flowers.

Screen Traveler, by Philip Gendreau

Mount Whitney towers almost three miles above sea level.

In late afternoon, Mr. Scott drove into another park. The children gasped as they stared up at giant trees. These were the largest they had ever seen.

"You are looking," said Mr. Scott, "at the oldest living things in the world. They are probably from 2500 to 4000 years old. In the time of Christ, they were already great trees. Some reach a height of over 300 feet. This tree we are coming to is the Grizzly Giant. It is over 90 feet around and over 200 feet thick. These giant trees are Sequoias. They are named after Sequoyah, a great and wise Indian chief."

After a night spent near the park, late morning found the Scotts staring upward again. The big trees this time were in Sequoia National Park. Here they saw the giant General Sherman tree, over 270 feet high and over 100 feet around.

"The lumber in that tree would make a big house," said Jack.

Mr. Scott, being a builder, stared thoughtfully at the tree. "I should say we could build over a hundred houses out of that tree," he replied.

"But who would think of cutting such a wonderful tree for lumber!" exclaimed Carol.

"Once, lumbermen did cut the Sequoias," replied her father. "Now, our government owns and protects them, so that all our people may enjoy them."

These people seem very small next to an ancient Sequoia tree in General Grant Grove.

National Park Service

There was an exciting moment when they came to a tree named Wawona. Mr. Scott drove the car straight through a passage cut in its trunk.

On the way south, Mr. Scott stopped the car to point out a great mountain. "That is Mount Whitney," he said. "The top is about three miles above the surface of the sea. That is the highest point in the United States excluding Alaska."

Philip Gendreau, N. Y.

Wind carves patterns in Death Valley, the lowest part of North America.

In and about Los Angeles. The next day found them traveling away from the mountains. Far away, they caught again the glitter of the Pacific Ocean. They passed town after town, and beautiful houses built on high hills and the edges of cliffs. At last they found themselves entering the great and busy city of Los Angeles. Here they stopped for the night.

The next day was full of odd contrasts. Early in the morning, Mr. Scott drove into Hollywood where movies are made. Each great movie company had space and buildings enough to equal a good-sized town. Mr. Scott was able to take the family onto the grounds of one company. It was great fun seeing the old "settings"—fronts of buildings without any backs, whole streets of strange houses, great stages. Jack was delighted to see indoor scenes being taken for a Western movie.

The day spent at Disneyland was exciting. So was their first glimpse of the Pacific Ocean. There was a stop at an ancient mission church, hundreds of years old. It was built by Spaniards, the earliest settlers and rulers of the land. There were visits to oil fields where hundreds of derricks reached high into the sky. They passed enormous airplane factories. At the port of Los Angeles, they viewed a fine protected harbor where ships loaded cargoes for many lands around the world. The day ended at the wonderful beaches that line the coast for miles.

From Death Valley to Hoover Dam. Leaving Los Angeles the next morning, the Scotts passed through a lovely irrigated valley where rich crops grew.

Nevada State Highway Dept.

Hoover Dam puts the waters of the Colorado River to work.

There were also orchards of oranges and other fruits. For hours afterwards, they rode up narrow valleys and mountain grades. The beautiful forests were gone at last. The land became dry. The air was hot. In late afternoon, they drove through a mountain pass. Below them was a broad, flat valley. No crops grew there.

"We said Mount Whitney is the highest point on our United States mainland," said Mr. Scott. "You are now looking down on Death Valley, the lowest part of North America, over 200 feet below sea level. It is so named because many pioneers died here, owing to the lack of water and the terrific heat, while trying to cross it in summer."

"Are we going across it?" asked Jack, somewhat uneasily.

"No!" said his father. "It is too hot now. But I wanted you to see it."

"No one could ever live or work there," said Carol.

"A few people do. They mine some gold, silver, and other metals. Borax, used in making soaps and other things, comes from here."

That night was spent at a desert ranch. The next morning they rode on through dry country, crossing Nevada to Boulder City. Just beyond, they came to Hoover Dam, the largest dam they had seen. The water it held back formed a large lake, bordered by beautiful scenery. The dam itself was over 700 feet high and a quarter of a mile wide.

"What is the need of a great dam like this, way off from everything?" asked Carol.

"The stream is the Colorado River," said her father, "one of our great rivers. Formerly, when in flood, it caused serious damage in lower California. Now, this dam holds back the flood waters and lets them out gradually. Dangerous floods have been stopped. Nearby states benefit greatly by having water for the irrigation of their arid lands, and for electric power. Much of this electricity is used in Los Angeles. By the way, when we cross the dam, we will be in Arizona." He smiled. "We are going to see the Colorado River again."

Leaving Boulder City in the morning, Mr. Scott drove rapidly through northern Arizona. Much of the land was dry. Where water could be obtained, there were green patches of rich growing crops. It was very hot, but the dry air made the heat less wearing. Now and then, they passed Indians, usually on ponies, sometimes afoot. The men wore bright-colored shirts. The women, too, liked bright-colored clothing. Many wore strings of beads and metal ornaments.

"The men fix their hair in different ways," said Carol, after a time. "The women's ornaments are different, too."

"They must be of different tribes," said her mother.

"Those chaps with the bright ribbons around their hair and foreheads are Navajos," added Mr. Scott. "Indians own much land in Arizona and New Mexico."

Presently, they stopped to let the children buy pieces of Indian work from women by the roadside. Carol bought a string of blue-green turquoise stones. Jack chose a bead pouch. Their mother bought a handsome basket with a tree design.

H. Armstrong Roberts

The Grand Canyon, carved by a mighty river

The Grand Canyon. Late in the day, they drove past a sign that read GRAND CANYON NATIONAL PARK. After supper, Mr. Scott and his wife talked long with a keen-eyed man who had come in with a party. Later, they talked with a tall, young Indian wearing the Navajo headdress.

"Something's up!" said Jack.

"Another surprise, I expect," returned Carol.

The next morning the air was bracing. It was so clear a day that objects far away seemed close at hand. The Scotts walked along a thickly wooded path. Jack and Carol wondered what was ahead. Without warning, they came out of the woods to find the earth had

dropped away, almost at their feet. The sight before them was so unexpected, so grand, that they just stared. Not even Jack had anything to say. Carol let out a deep breath of wonder and delight.

This was the Grand Canyon. They were to learn that it was over 200 miles long, a mile deep, and four to 18 miles wide. Far down at the bottom was the silver streak of the Colorado River.

It was not just one gorge, or deep, narrow valley. There were hundreds and hundreds of smaller gorges running into the main one. The land was cut into all sorts of odd shapes. Some looked like mountain ranges. Others were like flat-top mountains, or *mesas*. Carol and Jack pointed out one form after another and gave each a name—a tower, a castle, a temple, a fort, giant steps, a dragon.

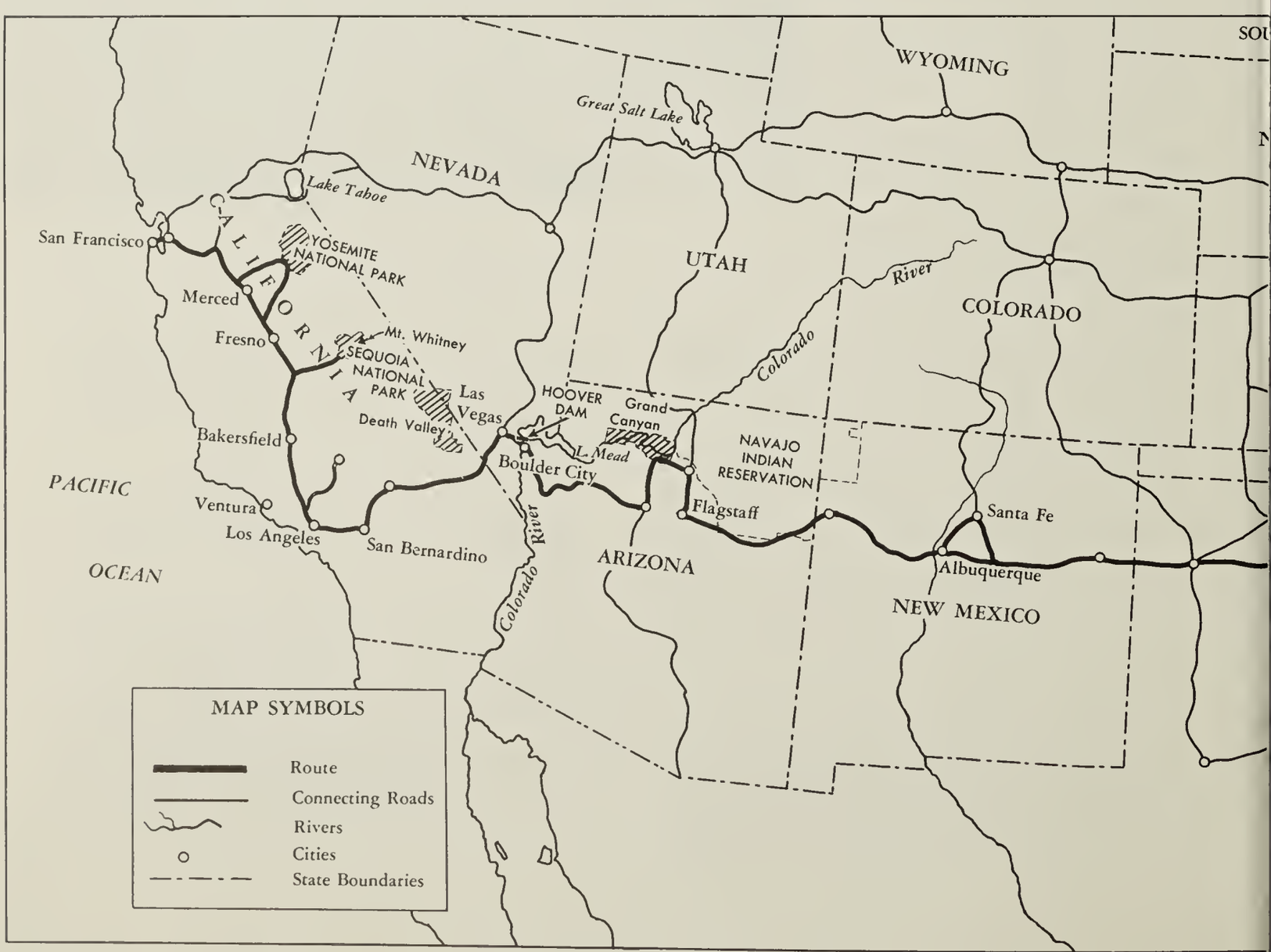
"They're all painted, too," cried Carol, "in such wonderful colors."

Of course they were not really painted, but the stone had many colors, rich and deep. Some ledges were bright red, others yellow and warm browns. In certain lights, other ledges were blue or green or gray.

"And it's all cut by one little river." Jack spoke as if he couldn't believe it.

"Over many, many thousands of years," said his father. "That 'little' river is large and very swift. Few people have ever been able to make the trip through

This road map shows the highways followed on the Scotts' trip eastward.



the main gorge on it, even in specially built boats. Thousands of years ago, it must have been even larger."

"I've read much about Grand Canyon, but it is more wonderful than any words can describe," said Mrs. Scott.

"It's worth the whole trip," said Carol.

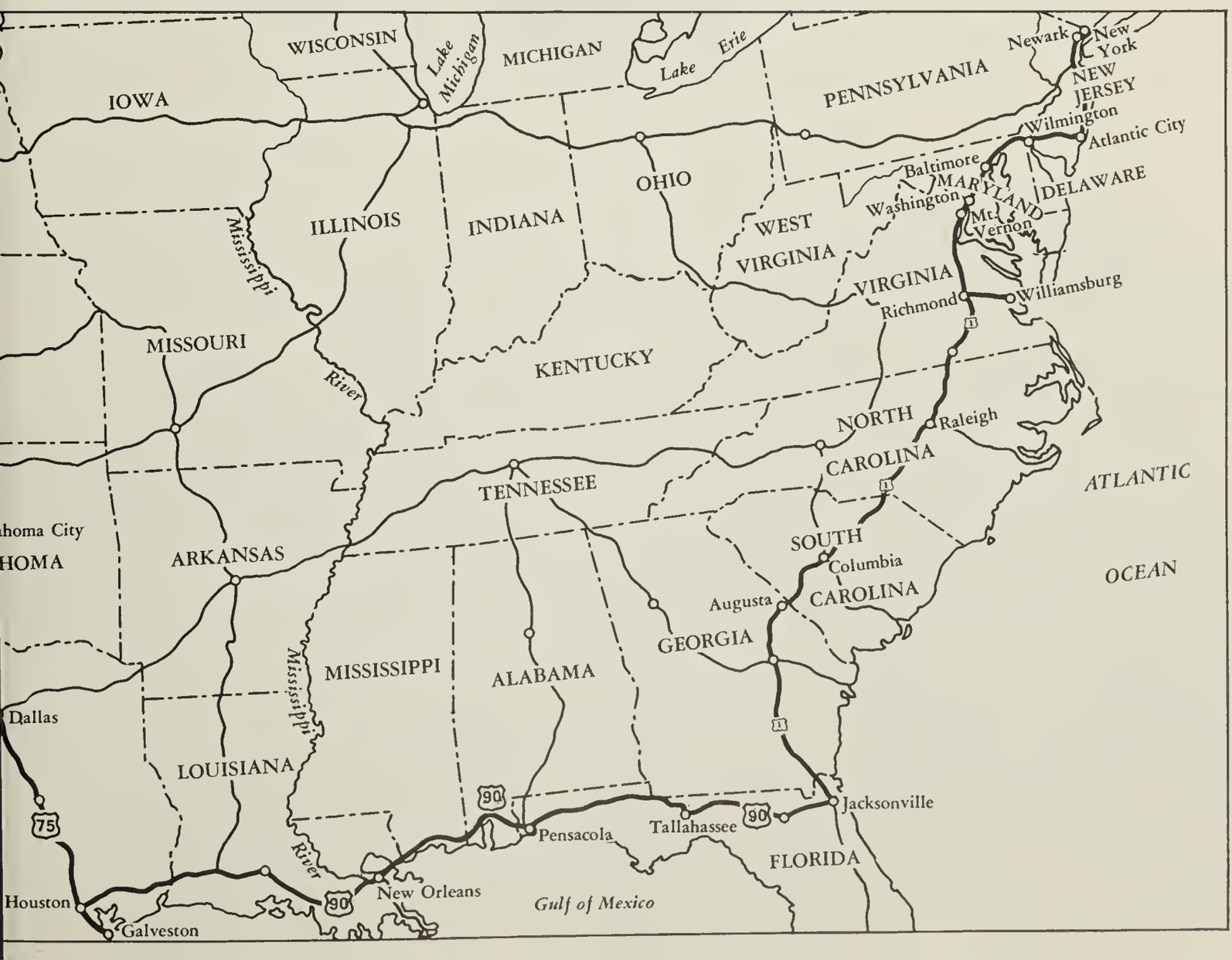
They spent the day exploring along the "rim," or edge, of the gorge. At one point, they stood on a ledge that jutted out over the canyon. Here were some of the grandest views of all. By now Carol and Jack did not mind the drop beneath their feet. They had become used to great heights and distances.

They wanted to take one of the two trails that slanted down the sides of the gorge to the river level, riding shaggy little burros. Their father felt they had had excitement enough. They still had, he said, a long trip ahead of them. However, he did arrange a short ride for them on the long-eared burros. A guide took them to some fine view-points.

Morning found them heading eastward. They left the forest and entered dry lands where coarse grass and desert bushes grew. Now and then, in sandy stretches, they passed tall, thick, cacti. Lizards sped across the road ahead.

Once Mr. Scott stopped the car where they could see the immense tracks of

Follow each step of their progress on this map.



Navajo blankets are traded for food at Indian trading posts.

some giant creatures, preserved in rock. "When our continent was young," he said, "great dinosaurs roamed this region. Some were larger than any creatures that live on land today. This one probably stepped in mud that later turned to stone."

A Visit to the Navajos. They had been traveling on Highway 66, which was a wonderful road. Soon, they turned onto a gravel road. It led them through one of the Navajo reservations. A reservation is an area which has been set aside by our government for the Indians. There are many Indian reservations in the United States.

It was not long before they parked their automobile in front of a general store. This store seemed to be the center of activity. Inside the store, they noticed a great many different articles for sale. At one place in the store there were many items usually found in a grocery store or a supermarket. In another part it contained dry goods or clothing and a variety of different cloths or yard goods. There were simple tools and many other things which the Indians could use.

A Navajo Indian woman was buying some groceries from the storekeeper. She had a little girl who stared wide-eyed at the visitors. It seemed that the woman had sold three Navajo blankets to the storekeeper. Now she was using the money received to buy some more materials. The storekeeper would in turn

sell the beautiful blankets to tourists who would come to the store.

Mrs. Scott had gone to the candy counter and had come back with a big stick of candy. "Here, Carol," she said, "give it to the child."

Carol took it and held it out. The child started to reach for it. Then she stopped and looked up at her mother. The mother said something softly, and smiled at Carol. The child's tiny hand shot out, and almost instantly one end of the stick was in her mouth.

Soon the woman and the little girl left the store. The storekeeper remarked, "These Navajo blankets show excellent skill. These Indians should be proud of their work. Now what can I do for you?"

"I'm Mr. Scott. I . . ."

"Oh yes, I am Mr. Reeder. I have been waiting for you. Sees Far is taking you out on the range for a visit. I hope you have other clothes to change into. The air is full of sand which is being blown by the winds."

Jack's and Carol's faces beamed as they thought about the adventure that they were about to have.

Mr. Reeder told them to go into the back room where they could change clothes. "Better hurry," he said. "Sees Far will be here soon."

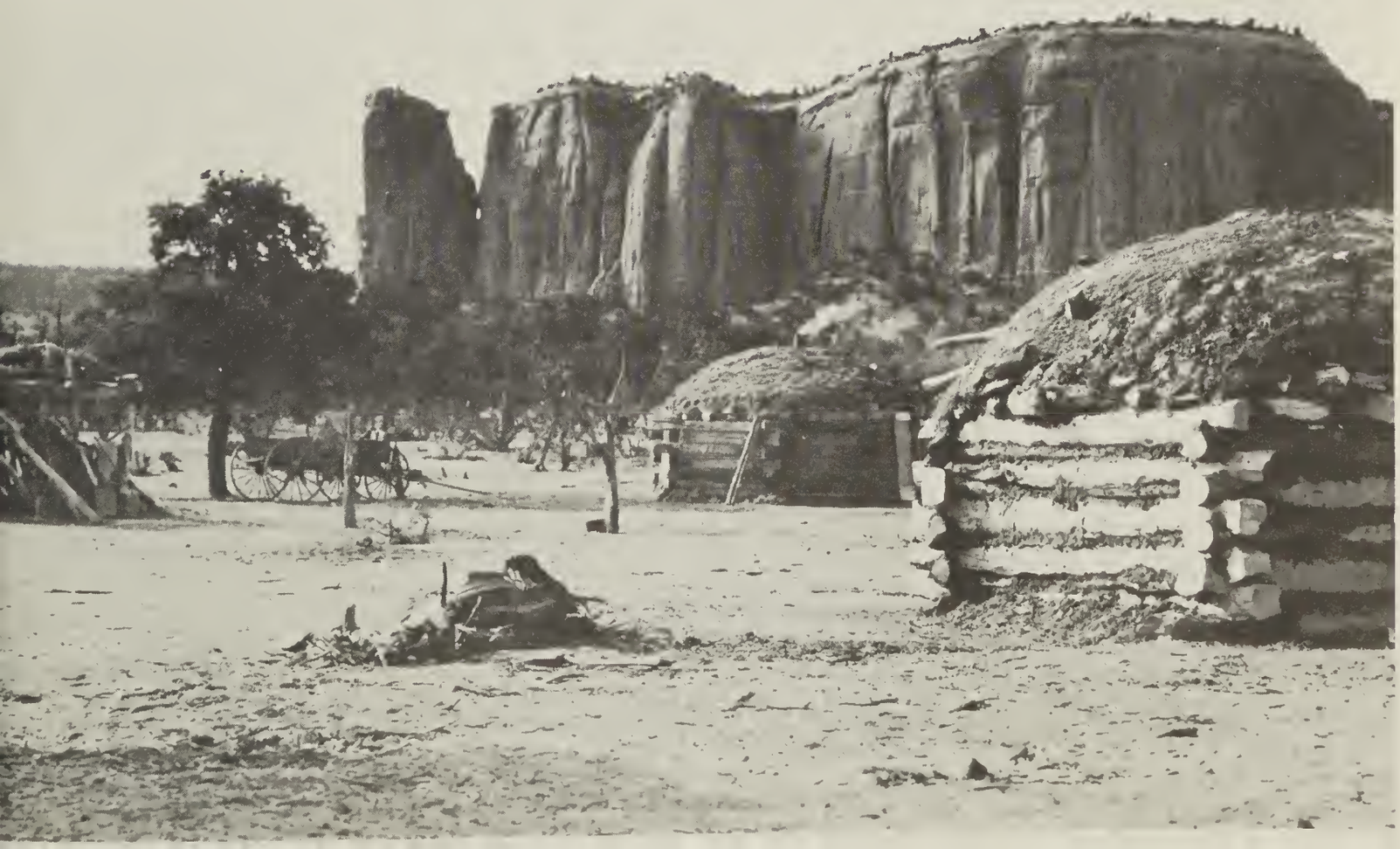
Carol and Jack were staring, round-eyed. "You mean," said Jack, "we're going out among the Indians?"

Carol and Jack were staring, round-eyed. "You mean," said Jack, "we're going out among the Indians?"

"This is Dad's surprise," laughed their mother. "I'm glad you learned to ride last year. Come and get ready!"

Navajos build their houses out of logs and clay. Notice that there are no windows in these hogans.

H. Armstrong Roberts



Philip Gendreau, N. Y.

Giant cactus plants, some hundreds of years old, grow in the stony, sandy soils of the West.

They were soon ready, clad in simple Western rigs and wide-brimmed hats. Impatiently, the children waited on the porch for the guide to appear.

"Why not take them to Bright Cloud's hogan over yonder. He does fine silver work," said Mr. Reeder.

They walked over to the hogan. It had six sides and was almost round. It was made of large cedar logs, notched at the corners. They were plastered with clay to fill all cracks. There were no windows, but there was a doorway on one side. A heavy woven blanket was used as a door, but was now pulled aside.

The roof was made of smaller logs and was dome-shaped. It was covered with sod. There was a smoke hole in the middle through which stuck the end of a stovepipe.

A pleasant looking young woman came to the door as they came up. She spoke very good English as she talked about Indian folklore. Her husband was working close to the door where the light was better.

Inside, the hogan was fairly cool. Clean white sand covered the floor. Sheepskins in one corner served as a bed. There was a small stove that burned wood. Something stewing in an iron pot smelled good. Around the room were boxes to serve as seats, besides one chair fashioned of tree roots. But oddest of all was a modern sewing machine, at which the young woman had evidently been stitching a dress. She laughed now.

"Yes," she said, "it's really a sewing machine. You see, my husband and I went to the Navajo school where we learned to do many things."

Flocks of goats are driven across desert land to high in the mountains where there are green pastures.

H. Armstrong Roberts

Meanwhile, Bright Cloud worked right along. On a stump, he had a foot-length of a railroad rail. He used this as an anvil, on which to hammer his silver into shape. He was making a ring. Now and then he took up a piece of rich blue turquoise to fit in as a stone.

"I should like a ring like that for my daughter. We will be back here tomorrow. Could you make it?" asked Mrs. Scott.

"It will be ready," said Bright Cloud. He beckoned to Carol and measured her finger.

"And for my boy?" asked Mrs. Scott.

"A knife pouch of sheepskin, ornamented with beads."

"Splendid," said Mrs. Scott.

A shrill yelp interrupted their talk. "That will be Sees Far," said Bright Cloud. "Go. You will see us tomorrow."

Mrs. Scott and the children hurried back to the store. There was Sees Far, standing beside a beautiful pony. It was a black and white pony, known as a piebald. Nearby were a half dozen ponies of different colors, held by a small Indian boy with a bow slung over his shoulder.

Mr. Reeder and Mr. Scott were at the door. "I have fixed a lunch for you in the dining room," said Mr. Reeder. "We'll join you as soon as we've made arrangements with Sees Far."

An hour later, the Scotts were on their way. Sees Far led the party on his piebald. It danced and showed off. The Indian sat on a saddle beautifully ornamented in silver. Then came Mr. Scott on a dark pony, Mrs. Scott on a white pony, Carol on a tan pony, and Jack and the Indian boy, Little Bow, on piebalds. Little Bow rode bareback, leading a packhorse.

The ponies were easy to handle and not hard to ride. For a few miles the party rode through dry open country along a narrow road. Once they passed a Navajo woman and a small boy. They were driving a flock of white goats. The woman had a small frame in her hands, on which she was weaving a strip of woolen cloth as she walked along. Later they passed a fine field of corn growing in a protected hollow.

"Do you raise much corn?" asked Carol.

"Only where we have water. Navajo land, dry land," said Little Bow. "We go miles for water for ourselves and our flocks." Like all Navajo children, Little Bow went to a government school. He spoke very good English.

Later when they stopped to rest, Jack asked, "How did you get your name, Little Bow?"

"Always, I have made bows and arrows and used them."

"I'd like to try that bow," said Jack. He had practiced a lot on the home playground.

Little Bow smiled. He handed over the bow and an arrow and pointed to the trunk of a tree. It was some distance off.

Jack took the bow and tested it. This was a long distance for him. He aimed carefully. To his delight, the arrow flew true and "plopped" into the trunk.

Little Bow eyed him with respect. He took back the bow, fitted another arrow to the string, and shot without seeming to aim. The arrow drove into the trunk at the very point of Jack's arrow.

"Notched it!" cried Jack. "That's shooting!"

Little Bow tried not to smile at the praise, but his lips quivered. He dropped the reins over his pony's head and started to recover the arrows. Jack hurried to join him. They were talking when Sees Far called sharply from the road. Little Bow stopped short and thrust out an arm to hold Jack back of him. A faint, reedy, whirring noise came to Jack's ears.

Little Bow pointed. Just ahead a snake was coiled. Its raised tail quivered. But as the little Indian reached for his bow, the snake uncoiled and slid into a pile of nearby rocks.

"A rattler!" gasped Jack, "the first I've seen outdoors. My, but Sees Far spotted it quickly."

"Sees Far, my brother, has the sharpest eyes in the tribe," said Little Bow proudly.

When they returned to the trail, Sees Far was very grave. "Little Bow should always watch," he said sharply.

"Little Bow was to blame," said the black-eyed little boy. "He has had his lesson. It will not happen again."

Sees Far grunted and started on. But the Scotts, for some time, were watching the ground more closely than the distant scenery. They climbed slowly upward. Coarse grass and stray clumps of trees appeared. They rounded a bluff, and on a

Most of the Navajos' land is very dry. They must drive their flocks many miles for water.

Union Pacific Railroad Colorphoto

grassy slope saw sheep feeding. Some were white; others were black. Sheep dogs barked sharply.

From two summer hogans came men and women and children. They were a friendly people and greeted the party warmly, though some of the older folks did not speak English. Sees Far talked with them in their own tongue. A man stepped out to help with the shelter tent; and a bright-eyed young woman came to help them with their meal.

"Our people would like to send you some of our lamb stew. It is lean and it is flavored with herbs we find. With us," she added with a smile, "it is usually lamb stew or roast mutton. We live on our sheep and what little corn we can grow."

"I should like to have some stew," said Mrs. Scott. "We appreciate your thoughtfulness." Then she added quickly, "There are some of our provisions we would like to share with you. I'll send—no, I'll bring them over."

She selected some canned fruit, bread, and candy that Mr. Reeder suggested. After the stew had been brought to her, she walked over to the hogans with Carol. The women were busy cooking the evening meal. Small children were playing about. A couple of men were smoking, squatted beside a rock. A very old woman sat on some sheepskins. They all eyed the two as they approached.

Mrs. Scott hesitated an instant. Then she walked straight to the old woman. She heard a murmur of approval that showed she had done the right thing.

"We wish to share our meal with you," she said simply.

A girl repeated the words in the Navajo language. The old woman bowed and spoke. The girl said the words in English. "The white woman is kind. She is welcome as a friend."

Meanwhile, Carol was going among the children, giving them sticks of candy. She gave other candies to the women. Then she walked over to the men and offered them some. The men each took a piece.

As Carol came back, a young woman stopped her. She fastened a bright blue band over her fair hair. "Sun Cloud," the woman said, smiling. Others repeated the words.

"What did they mean, Mother?" asked Carol, as they walked back.

"Indians often give names that describe something," said Mrs. Scott. "Your fair hair makes them think of clouds with sun shining through. The blue ribbon stands for the bright blue sky."

Carol danced happily back to their own camp. Here all sat down to a meal that was a mixture of Indian and American food. The stew was well cooked and made tasty by wild herbs. The flat pieces of Indian bread, made of corn meal, tasted different from the corn bread their mother made. The children liked it, although they would have eaten it anyhow because it was Indian food.

After they had finished their meal, they talked about the changes that were taking place. The life of the Indian, they found, was not so different from their own as they had imagined. Transportation and communication seemed to change the old way of living. Schools were helping the young Indian children to live better. Even the older people were using more and more of the modern conveniences. Carl and Jack, however, were

interested in hearing about the "old days" from the Indian directly. It all seemed very real as they listened to the stories.

As darkness fell, the stars came out bright. A new moon shone, well up in the sky. In front of a hogan, a large fire sent tongues of flame swirling upward. Presently the thudding of hoofs sounded in the stillness. The camp dogs barked. Out of the shadows rode a Navajo horseman, at full speed. He stopped before the fire. Greetings were exchanged. Then his pony was led away.

Other figures appeared. A whole family arrived in an old farm wagon. A circle was formed around the fire. The men were in front. The women and children were back of them. Mr. Scott sat between Sees Far and an old Navajo brave. The singing began. Only the men sang. The old man started the first song in a thin, high voice. The deeper voices of the younger men joined in. It sounded like a hymn or chant.

"That is a prayer for a good harvest," explained Sees Far.

Then Sees Far began to lead the singing. He had a deep, rich voice. The singing ended with a bright, quick song. "They are wishing you well on your journey back," said Sees Far.

"May I answer in song?" asked Mr. Scott. At the young Indian's nod, he rose and sang in a fine tenor voice, "America, the Beautiful." As he started the second verse, Sees Far's deeper voice joined in. Carol and Jack were very proud of their father for taking part in this way.

Soon they were in their shelter tent. After the heat of the day, it was very cool at night on this high plateau. The warm blankets felt good. But for a time the children could not sleep. The hoots of owls and the cries of other night birds kept them awake. Even more, the howls of wolves and the smaller coyotes disturbed them. They felt safer when they heard the shepherd dogs barking and knew they were on guard.

This Navajo woman rides through the "Ear of the Wind." Can you guess how this pass was formed?

Free Lance Photographers Guild

Sleep came to them at last. They awoke in bright sunlight and caught the scent of broiling bacon. After breakfast, they and their mother went over to a hogan to watch a woman work on a Navajo blanket. The loom on which she wove the bright red, black, white, and yellow blanket was a big wooden frame. Threads ran up and down and across. The woman wove the cross threads in and out of the other threads and pressed each down tight on the finished portion.

The design looked like flights of steps, each in a single color. Beside the woman, on the clean sand floor, the design was sketched in sands of different colors. A weaver makes her own designs. Each blanket is different in design. It takes many days of hard work to make one blanket.

A young woman told them about the sheep on which they depend for food and clothing. In winter they drive their flocks to shelter near the wooden winter hogan. There the sheep must be fed on coarse grass the men have gathered. In the spring, after the lambs are born, the sheep are dipped, one by one, in a tank of liquid that kills the ticks and other insects that make them sick.

The Navajo women are skilled in the art of weaving colorful blankets and rugs.

Union Pacific Railroad Colorphoto

The sheep are sheared and the wool is scrubbed and cleaned. The women comb it and lay the tiny threads, or *fibers,* of wool side by side. Then they spin it into yarn on a spindle. The spindle is made of two pieces of wood. One is a round stick. The other is a flat round block with a center hole into which the stick is pushed. One end of the combed wool thread is fastened to the stick. By twirling the stick, the threads are twisted.

"What about the colors?" asked Carol.

"We clean the wool until it is white with parts of the Yucca, a desert plant. Our black sheep give black wool. Gray wool is made by making threads of mixed black wool and white wool. The bright colors come from dyes made from desert plants.

"In summer," the Indian girl continued, "we come out here for the sheep to have the grass. If the springs are dried up, we dig down into dry stream beds until we strike water. We grow a little corn and squash, and we have our animals for food. We also trap rabbits."

The Scotts had to start back. While the others were packing, Little Bow showed Jack how the Indians set snares to catch rabbits. But the boys were soon called back. The others of the party were mounted and ready to start. The little group of Navajos gathered to wave farewell. By noon, the trader's post was in sight. After a hurried stop at Bright Cloud's for the beautiful ring and pouch, and a brief pause at the trader's for lunch, they were back in the automobile.

Before leaving, Mr. Scott gave Sees Far a beautiful hunting knife. Jack gave Little Bow a small knife to match it. Little Bow took his bow and his quiver of arrows and gave them to Jack. "You take," he said. "I make others."

Jack was delighted and thanked him warmly. He waved back to the little Indian boy as long as he was in sight.

They drove steadily, passing Indian reservations and forest areas and strange regions they would have liked to explore if there had been time.

On the highway, they passed many Mexicans. Mr. Scott said that their nation, Mexico, was to the south of the

In the drier areas of the Southwest, towns are few and far between. Why?

Texas Highway Department

United States. It had once owned our states of California, Arizona, New Mexico, and Texas. These people were friendly and smiling. Some called greetings in their own tongue.

Through the South to Washington. The next day the Scotts crossed into New Mexico. They still passed reservations and parks, and mountain and forest regions. Clearly this state had many things worth seeing. Mr. and Mrs. Scott were sorry they could not take time to visit the great Carlsbad Caverns. The caverns were too far off from the road they had to follow.

Another day found them passing through Albuquerque, New Mexico, a small city with many houses and some churches of the Spanish type. Beyond the city, they stopped to see some of the stone and mud-brick towns of the Pueblo Indians. Some of the pueblos were lived in; some were in ruins. They were flat-topped structures of many rooms. They had two to seven stories, or levels. Each new story was set back from the one below, so that the roof of the lower became a yard for the next above. Instead of stairs, ladders were used. In the old days when enemies were near, these ladders were pulled up at night.

"They're like old, old apartment buildings," said Carol.

"Exactly," said Mr. Scott. "Each holds many families. Years and years ago, many were built on mesas. The people lived together and built their homes in this way for protection against savage Indian tribes."

Soon the highway carried them into Santa Fe, the state capital. Mr. Scott said that it was the oldest capital city in North America. Long before the land became part of our country, it had been the Mexican government city for a great region. In it they saw many old *adobe,* or mud-brick, buildings.

Although the land was still quite dry, streams were crossed more frequently. When they passed a great mesa of dark stone, signs told them they were in the state of Oklahoma and looking at its highest point.

"This state was once Indian Territory where many Indian tribes had reservations," said Mr. Scott. "Many Indians still live here. They live in houses much as we do. Some have fine farms. Many have oil wells on their lands. Oklahoma is a great oil state."

Cattle ranches shortly took the place of the dry lands. Following came farm lands on which familiar crops were growing. There were lovely lakes, too, bordered by trees and bluffs. Many of these lakes had been formed by damming streams. Some had parks along the shore, with camps and boats. The Scotts spent the night at one of these parks and took a moonlight ride on the water.

Morning found them passing through Oklahoma City and heading south. Almost immediately, they found themselves in the midst of oil and natural gas fields.

The derricks rose high in the air on every side. There were whole settlements of tanks, like giant tin cans, and other immense globe-like tanks for the storage of oil and its products. They passed great buildings where the raw oil was changed to gasoline and other products. Lines of tank cars filled the railroad sidings.

"Is this oil shipped all over the land by train?" asked Jack.

H. Armstrong Roberts

Oil derricks are abundant around the capital city of Oklahoma. Do you remember its name?

"No," said his father. "Some of the oil goes to market by train. Much is pumped through great pipe lines which run underground to the neighborhood of Chicago or New York. Oil is shipped by tankers over the ocean and the Great Lakes. Natural gas can be sent only through pipe lines.

Texas. The next day the Scotts crossed into Texas, a large state of many contrasts. It is so large that it has many different kinds of soil and climate. For these reasons, it grows many different crops and has a wide variety of industries.

Mr. Scott said that Texas has been ruled by a number of different nations. Over a hundred years ago, it won its independence from Mexico. For a number of years, it was a free nation. Then it joined our country as a state.

The main ranch lands of Texas lie to the west, but the Scotts passed a few ranches that had fine beef cattle. There were more rich farms. The soil on these farms was very dark. In many fields were rows and rows of bushy plants with white or purple flowers.

"I haven't seen that crop before," exclaimed Carol.

"We are in the edge of the Cotton Belt," her mother told her. "You will see many fields of cotton growing in this black, waxy soil. The blossoms are

Herbert Lanks, from Black Star

Many fields of cotton are planted in the black, waxy soils of the Cotton Belt.

white, but soon turn purple. After the flowers drop off, the cotton bolls form. At first, they look like tiny green Christmas-tree bulbs. They grow and ripen. Then they burst and the white cotton fibers fluff out."

The next day they rolled into the city of Fort Worth, the center of the cattle industry. A few cowboys and ranchers were seen. Pens beside railway sidings were jammed with cattle for shipment.

Moving eastward through Texas, the Scotts passed through timber belts of yellow pine and big orchards of pecan trees. In the central part, they passed by great vegetable farms. They saw other cities, too. One was the beautiful city of Dallas. It is a railroad center and an important cotton market. It has many industries. Houston, they discovered, was another busy inland city. It is a cotton and oil-shipping center. Though it is nearly a hundred miles from the sea, a long canal allows ocean ships to come to its docks.

Finally there was Galveston, in the heart of an oil region, with its giant sea wall to protect it from the severe storms that sweep the Gulf of Mexico. It, too, is a great shipping center for cotton and oil.

They sped on. They had brief glimpses of fields of sorghum and sugar cane. These looked like giant grasses. They passed huge oil regions and salt and sul-

phur mines. Texas seemed to have everything.

One morning, they started across a wide belt of water on a long, high bridge. At the far side, the great city of New Orleans spread for miles along the waterfront. River boats, tows of barges, and great ocean steamers came and went.

Carol giggled as she turned to her brother. "When we crossed the Mississippi, going west, you didn't think so much of the river. What do you think of it now?"

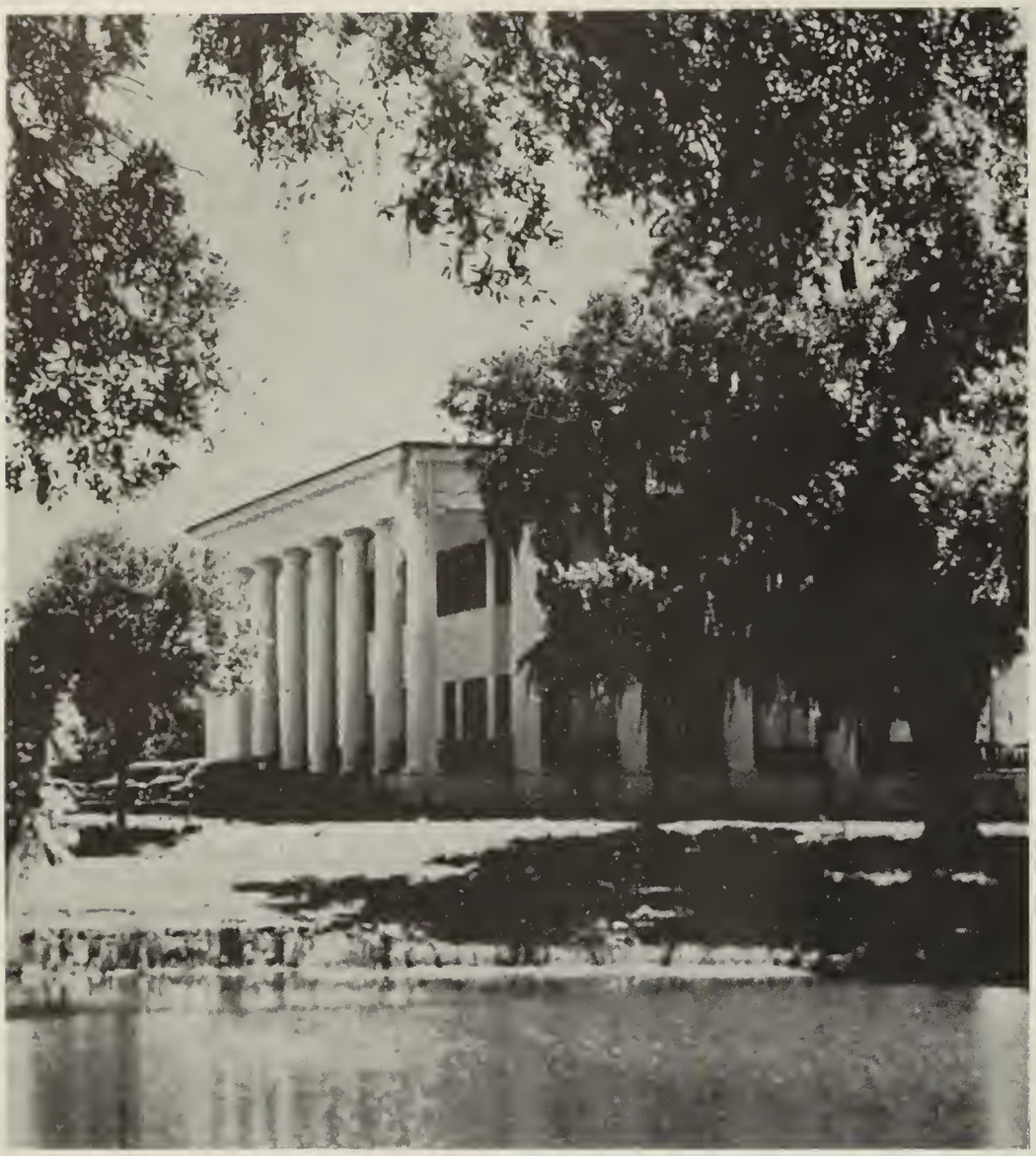
Jack grinned, "It's really big now! That's because it has swallowed a lot of other rivers on the way down."

"New Orleans is an old and great city," Mr. Scott told them. "Once Spain ruled over it and much of the land west of the Mississippi. Then the country of France became its master. France sold the city and the western land to our nation. That made our land reach from the Atlantic to the Pacific."

By now the Scotts were experienced travelers. In the day and night they spent in the city, they knew what to look for. They rode along the many miles of busy piers and saw ships of every nation. New Orleans, they learned, was the fourth largest port in our land. They saw the great *levees,* or embankments, that held back the mighty river in times of flood. They visited a large airport on a tongue of land that extended out into the river.

New Orleans, our fourth largest port, is lined with busy piers and great levees.

Rene Williams, from Black Star



Louisiana State Chamber of Commerce

Greenwood plantation in Louisiana was built in the early 1800's.

In the residence sections, they saw lovely Southern mansions, surrounded by strange trees and colorful flower beds. In the evening, they visited the old French section, with its interesting houses; and they dined in French restaurants on Southern dishes and delicious sea food.

The highway out of New Orleans led them near the coast of the Gulf of Mexico through the states of Louisiana, Alabama, Georgia, and Florida. The land was low and level, for they were back on the Coastal plains. The large farms they passed were now called plantations. The houses on them were often stately mansions with tall pillars on the front. A number of trees were new to the Scotts, including the live oak. Long streamers of ghostly gray moss hung from many of the branches. Here and there, bunches of green mistletoe grew on the boughs of trees. Everywhere were masses of gorgeous flowers. But the air was very warm and moist.

The growing crops were interesting, too. In the lowlands of Louisiana were rice fields, each fenced in by embankments and flooded with water. In some places the water had been drawn off and the grain was ripe for harvesting.

Besides fields of sugar cane and cotton, there were groves of pecans, almonds, and other nuts. Scattered groves of oranges appeared. In Alabama and Mississippi they passed orchards of strange trees with deep green leaves and spreading tops. These were tung trees, whose fruit produces a valuable oil.

Acres and acres of low bushes of another crop were seen everywhere. The stems of the plants turned downward into the soil at many points. These plants were peanuts.

"They are one of the great crops of the South," said Mr. Scott. "You know them as a nut and in candy bars and peanut butter. Their oil is used in many ways. You know, once cotton was the great crop of the South. If that crop failed, the farmers had nothing. Now the farmers grow many crops. If one fails, others succeed. The farmers are better off."

Virginia State Chamber of Commerce

Beef and dairy cattle graze in the rich pastures of the Coastal Plain.

When the Scotts rolled into Jacksonville, they decided to stay over until Sunday in this city. Though it is a very old city, they discovered that Jacksonville is now a busy industrial, financial, and rail center. Located on the St. John's River, just 18 miles from the Atlantic, it is also an important port.

Northward Bound. "On Monday," said Mr. Scott, "we shall go north on another famous road—the Dixie Highway. It will first take us inland over the lower plateau of the Appalachian Highland. We will pass through four more of the thirteen original states of our country."

This section of the trip was interesting all the way. Cotton and peanut fields continued. There were seemingly endless peach orchards and great areas of broad-leafed tobacco plants and fields of vine-like sweet potatoes. Beef cattle grazed in some pastures, dairy cattle in others. They passed through forests of southern pine, from which lumber, wood pulp, tar, and turpentine are obtained.

The scenery was lovely, with rolling hills, low mountains in the distance, and many swift streams. Power plants at these falls provided electricity. What was surprising was the great number of lumber, paper, tobacco, and enormous textile, or cloth, mills. Mr. Scott said that the textile mills had been made possible by air-conditioning. This kept the air at the right temperature and with the right amount of moisture for handling the cotton fibers. These cannot be handled well if the air is dry and very warm.

The Scotts passed through few cities on this line, but they did see Augusta, in Georgia; Columbia, capital of South Carolina; and Raleigh, a busy manufacturing city and the capital of North Carolina.

Virginia State Chamber of Commerce

Along the Dixie Highway are great fields of broad-leafed tobacco plants.

When the highway crossed into Virginia it left the plateau for the Atlantic Plain. It passed through fine farming lands. Many acres of peanuts grew among the familiar crops of the Central farm lands. There were beautiful estates. Finally the Scotts rolled into the city of Richmond, the state capital.

They visited the interesting capitol building and other historic points. But the children liked especially a long side trip down to Jamestown. Here they saw the old tower and restored church at the spot where the first permanent English settlement was made in our land in 1607.

A few miles away, they stopped in Williamsburg, once capital of the early colony of Virginia. Here, many buildings had been restored to look as in the old days. A Colonial coach drove down the street. Women in Colonial dress welcomed them in the different homes and public buildings. Carol could hardly be dragged away.

A few miles farther on was Yorktown, where George Washington won the last great battle of the War for Independence. All the way back, they passed many other historic spots, some of Indian times.

"Why, Virginia is just a great history book," said Carol. "When I come to study the history of our country, I wish I could study it in this way."

Morning found them still on the Dixie Highway headed for our capital city of Washington. On the way, they made one stop. That was at Mt. Vernon, so that all might see the quiet, lovely home of George Washington, facing the broad Potomac River.

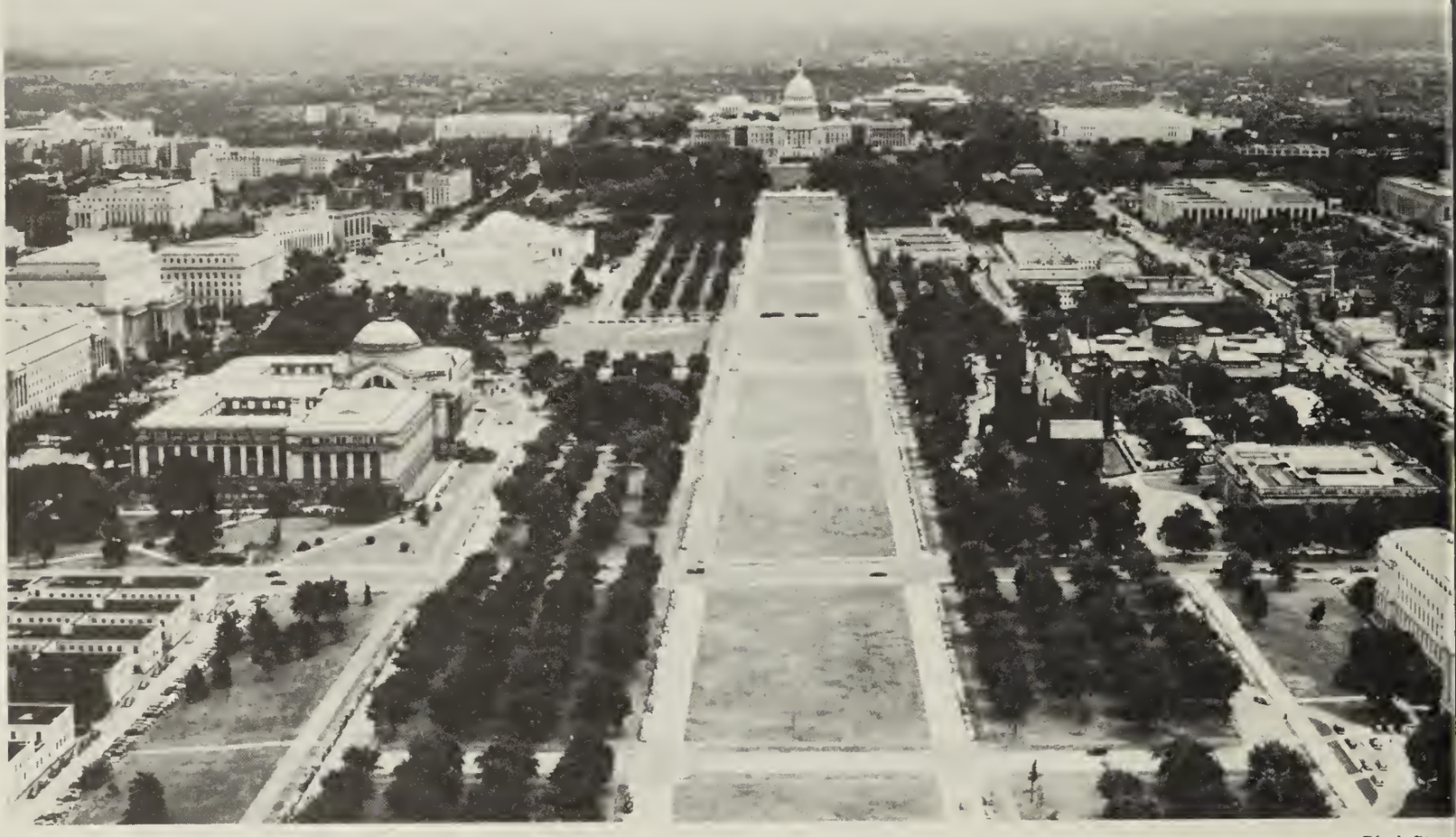
Washington and Other Cities. The full day spent at Washington was a busy one. First was a ride through the residence streets and the beautiful parks and by seemingly endless public buildings. They stopped at the White House, the Capitol, the Congressional Library, and the Su-

Virginia State Chamber of Commerce

The palace of the colonial governor at Williamsburg

Facing the broad Potomac River is Mt. Vernon, the home of George Washington.

Virginia State Chamber of Commerce



Black Star

Part of the city of Washington as seen from the Washington monument.
Do you know what building stands in the background?

preme Court Building, where the highest court in our land meets. Of course they visited the Lincoln Memorial and then went up to the top of the Washington Monument. All were weary enough when that busy day was done.

Baltimore, in Maryland, was the next stop on the Dixie Highway. It is a great seaport, a fish and oyster center, and a manufacturing city. Mr. Scott took time to drive out to old Fort McHenry.

"Do you know the words of our national anthem?" he asked.

"I know the first verse," Carol said, and began, " 'Oh, say can you see by the dawn's early light'—"

When she had finished, her father said, "After seeing this spot you should learn all the words. While a British fleet was trying in vain to take this fort, Francis Scott Key, a prisoner on one ship, watched the fight and wrote the song."

"I shall learn *all* its words, now," said Carol.

At the city of Wilmington, in the little state of Delaware, they left the Dixie Highway and crossed the Delaware River to New Jersey. On reaching the

coast, they followed the shore through one summer resort after another. One was Atlantic City with its famous boardwalk. The air was now cool and bracing.

Home Again. The next day they drove leisurely across New Jersey. In late afternoon, they passed through a tunnel under the Hudson River and found themselves among the tall buildings of New York City. Soon they were resting in their home living room.

"It was a perfectly wonderful trip, Dad," said Carol. "I'll never forget it. It was so good of you to take us. And yet, it's good to be home, too."

"Your mother and I enjoyed it as much as you did," said her father.

"Just think!" exclaimed Jack. "We saw our whole country."

"By no means," answered his father. "You have seen only a narrow strip along each side of the roads we took. There are many other states we did not pass through. Each has its strange and wonderful sights.

"What you have seen will help you understand that there are ways of living different from our own, many different kinds of work to be done, and many kinds of places in which people live."

QUIZ QUESTIONS

1. Through what state did the homeward trip first pass?
2. Name the great national park where the Scotts first stopped. For what, in particular, is this park famous?
3. What name is given the "big trees" of California?
4. What great city was next visited? Name two of its industries.
5. Name the highest and the lowest points in the United States.
6. What great dam is built across the Colorada River? Of what use is it?
7. Where is the Grand Canyon of the Colorado? Give two facts about it.
8. What Indian reservation did the Scotts visit? In what state?
9. On what do these Indians largely live?
10. Tell about the pueblos.
11. What ancient capital city was visited in New Mexico?
12. What is the present name of the old Indian Territory?
13. Name six main products of Texas.
14. What city of Texas is a cattle center? What inland city is a seaport? Explain.
15. What great river was crossed after leaving Texas? To what city?
16. In traveling from Texas to Florida, what crops did the children see?
17. What old city did the Scotts visit in Florida? What nation founded it?
18. Name the first three states crossed by the Dixie Highway north of Florida.
19. Name three important crops in all these states.
20. What can you tell about manufacturing in these states?
21. Name Virginia's greatest city?
22. Name four historic points in Virginia visited by the Scotts.
23. What is the city of Washington?
24. Name at least four points of interest visited there.
25. Why is Baltimore an important city?
26. Why do we remember Fort McHenry?

TELL A STORY

1. Tell a story about the "big trees" of California.
2. Tell a story about the Navajo Indians.
3. Tell a story about the Grand Canyon.
4. Tell a story about Williamsburg.
5. Tell a story about Texas.

The Amazon Rain Forest is hot and wet, and filled with strange animals and rich green plants.

Standard Oil Company (New Jersey)

Products from the forests of South America are loaded onto freighters for export to all parts of the world.

Unit VI

THE AMAZON BASIN, A HOT, WET LAND

Locate the Equator where it crosses South America. Just south of the Equator, where the sun's rays fall directly or nearly directly on the earth all the year, locate the Amazon River.

Perhaps you wonder what a rainy, tropical climate is like. Suppose, then, that you follow Joe Wilson on a trip he took with his father to the Amazon Basin. This Basin is a lowland area as large as our country. It lies across the Equator. Through it flows the largest river in the world—the Amazon.

Joe's father is a manufacturer who uses the lumber of certain trees that grow in tropical regions. Once a year he visits the Amazon Basin to arrange for materials that he needs. This year, to Joe's delight, he decided to take his son with him. He warned Joe that it would be very hot there. But Joe did not mind. The summer at home had been very warm and rainy.

By Air to Belém. On a cool, frosty morning, with the leaves on the trees already changing color, they left by plane for Miami, Florida. Mr. Wilson had to stop there on business. It was a lovely ride, looking down on mountain ranges and great stretches of farm lands, and finally along the Atlantic shore. At Miami, Joe had a chance to see a little of

Ewing Galloway, N. Y.

Native river boats which travel the mighty Amazon dock in the busy harbor of Belém.

the great resort city and its wonderful beaches. Already everything looked different. Instead of the trees he knew, there were many palm trees and giant ferns. Strange flowers made gorgeous masses of color.

They left late the next afternoon, riding in a great plane with about forty other passengers. Presently, the scene changed. They flew over the deep blue Caribbean Sea, a part of the Atlantic Ocean. Now and then, they passed over beautiful islands. As the sun seemed to plunge into the water, there was a gorgeous sunset.

Joe went to sleep early in his comfortable chair. The motion of the plane was easy and the air in the cabin was fresh and cool. But sometime in the night, he woke to find the ship pitching and tossing. Now and then it dropped, then shot swiftly upward. Outside, vivid lightning leaped from cloud to cloud and thunder crashed. Rain beat in sheets against the windows. He was scared.

"It's all right, Joe," said his father. "Nothing but a thunderstorm."

"It looks like the granddaddy of all storms!" gasped Joe.

"You'll get used to them in the Amazon Basin," said his father. "They pass quickly."

His father was right. Soon the sky was clear, and the stars were shining brightly. Joe dozed, but awakened before sunrise. The plane was flying low over a dense, deep-green forest that seemed endless. Now and then the silvery line of a big stream wound through the green.

Presently, they crossed stream after stream, spreading out somewhat like a fan. The streams, his father told him, were the many mouths of the Amazon River. Shortly, Joe sighted ahead the big city of Belém. Steamers lay at the many piers. The plane landed at a busy airport. Joe gasped as he stepped out. The sun was blazing hot. It was hard to breathe.

"Phe-ew!" he whistled. "The temperature must be over one hundred degrees."

"Sometimes we have a temperature as hot as this at home, only here the heat never lets up," smiled his father. "It's the dampness in the air that makes you feel it."

The city looked more like a home city than Joe had expected. The modern business buildings seemed familiar. There were buses and automobiles in the streets. But many of the people were in white and wore broad, light hats. Many used sunglasses. There was a scattering of dark-skinned Indians, stripped to the waist.

At the restaurant where they had breakfast, Joe overheard much talk in languages that he could not understand. His father said that Brazil, the country which owns much of the Amazon Basin, had once belonged to the European country of Portugal. Portuguese was the language still used, although some Spanish was spoken. But their waiter could speak English. In the stores where they stopped for light clothing, hats, and dark glasses, there were clerks who also spoke English.

Later they went to the water front and boarded a small river steamer. It was a pretty craft, newly put in service. It was painted white and had a comfortable air-conditioned cabin.

When they stepped out on deck, Mr. Wilson looked down at Joe's feet and chuckled. "I think you're losing something, Joe."

Joe looked down and around. "What?" he asked, puzzled.

"Much of your shadow," laughed his father. "At home you always have quite a shadow even at noon. Here the sun is almost directly overhead."

Joe grinned. "Most of it must have melted in the heat."

"Keep out of the sun as much as you can," warned his father.

The Mighty Amazon. Before very long, the steamer entered a great body of chocolate-colored water. Joe could not see the farther shore. "Is this a bay or a great lake?" he asked.

"This is the Amazon River," said his father. He went on to tell his son about this great stream.

The Amazon River rises in the Andes Mountains, not more than 100 miles from South America's western coast. Here its waters come largely from melting snow and glaciers. But the river does not flow west into the Pacific Ocean. Instead, it flows east and finally empties into the Atlantic Ocean nearly 4000 miles from its source.

Hundreds of streams flow into the Amazon from north, south, and west. They are called tributaries of the Amazon because their waters feed it. One of these tributaries is more than 2000 miles long. Sixteen others are each over 1000 miles in length. The water from these many streams makes the Amazon a mighty river. Near its mouths, the Amazon is 60 miles wide and looks like a great bay. So much muddy water flows

from its mouths that it colors the ocean for many miles out to sea.

The Amazon Basin. The Amazon River drains about one third of the whole continent. This region is called the Amazon Basin. The greater part of it is a low, level plain. So gentle is the slope of this plain toward the ocean that the river flows very slowly. The slight current and the great depth of the water make it possible for ocean steamships to sail up the river for 2300 miles. Smaller steamers are able to go about 500 miles farther.

A Region of Heavy Rains. In much of the Amazon Basin, the rainfall is 200 inches or more each year. This is five times as much rain as falls in New York state or about seven times as much as in Texas. Even in the drier season there are heavy showers every few days. In the wet season, beginning in October, the heavy showers come every day. Then the Amazon gradually rises. In some sections, it may rise 40 or 50 feet. Since the land is low, the waters pour over its banks for many miles inland. That is why railroads and highways cannot be built in much of this region. One must travel by boat or airplane.

"Why," asked Joe, "is there so much rain?"

"The sun and the winds are responsible," replied his father. "The sun makes the air very hot. Hot air can take up more water than cold air. Like a sponge, it draws up water from the streams in the Basin. Moreover, winds blow in from over the Atlantic, laden with moisture. All this moist air rises far above the earth. There the air is cooled and cannot hold so much water. Clouds form, and down comes the rain."

Map of South America showing the Amazon Basin

Forest Growth. "The forest seems so thick," said Joe. "I suppose the rain causes that. Are the forests like ours, Dad?"

"Very different, as you will see later," said his father. "Plants grow so rapidly in this climate that there are hundreds of miles of unbroken forests, or jungles, stretching away from each bank of the river. Great trees shoot up to a height of two hundred feet. They grow so close together that their branches cross and shut out the sunlight from the ground below. Creepers and vines join tree to tree. Ferns grow in place of grass.

"The undergrowth is so dense that one has to cut a path to get through. When such paths are cut through the forest, they are overgrown again within a few weeks. For this reason, and because of the floods, the natives do not build roads.

Even large steamers may be tossed about by the swirling tidal bore on the Amazon River.

Most of their traveling is done by boat. Often their boats are dugouts."

Joe wandered off around the deck. Presently a boy of his own age smiled at him. Joe was quick to pick up an acquaintance. Miguel, it seemed, could speak English. They chattered away, each asking the other questions about his home country. Suddenly Joe noticed that the steamer was swinging around.

"What are we going back for?" he asked Miguel.

"The bore, or *pororoca,* I suppose," replied Miguel. "The captain will meet it head on." When he saw that Joe did not understand, he explained. "The ocean tide comes several hundred miles up the river. It comes in so fast that its front forms a bore, or wall of water. Down here it will be about eight feet high. Come into the cabin."

Out of a forward window, they could see, far downstream, a white streak across the river. It came rapidly nearer, and now it seemed to rise higher and higher, a foaming wall of water. Joe felt nervous.

"Hold tight!" cried Miguel.

The water wall rolled up, nearly as high as the ship's bow. There was a shock. Two great waves were tossed off by the sharp prow. All around was foaming, swirling water. The steamer danced like a cork. Then the water grew quieter, and the steamer turned back upstream.

"I don't think I'll go canoeing down here," said Joe unsteadily.

H. Armstrong Roberts

Huge, scaly alligators line the banks of the Amazon. Can you imagine one twenty feet long?

Animals of the Jungle. The next day the steamer drew close to the shore. Now and then, it stopped at some trading post or loading pier. Here the water was shallow. A man stood guard in the bow to warn of mud banks or floating logs that might damage the ship. Huge, scaly alligators along the river banks slid into the water as they approached. Some were twenty feet long.

The boys saw great turtles, too, which the natives use for food. Once they stirred up a tapir on the edge of a marsh. It was a stocky, blackish-brown creature with a long nose ending in a small trunk. It had no tail to speak of. Miguel said it usually fed at night and was hunted by the dangerous jaguar.

At one stop, the two boys walked up a trail for a little way. Miguel warned Joe to look out for poisonous snakes, for there were many of them. Overhead little gray monkeys sprang from tree to tree and chattered at them. The hum of insects filled the air. The most brilliant and the largest butterflies Joe had ever seen fluttered around them. Bright-colored parrots squawked and rose in flocks from the treetops. Now and then a red and black macaw flew by.

Miguel pointed out a hairy creature. It was digging its long, narrow snout into an ant's nest. "An anteater!" he said.

He pointed upward, "And look at that sloth. It walks and sleeps hanging upside down." Joe could hardly see the creature. It was almost the same color as the tree trunks.

The trail was just a tunnel through the jungle, and Joe was glad enough to turn back. The trees met overhead. Great ferns and a tangle of vines made it impossible to see beyond a few feet. Farther from the river, where the land was higher, the trees grew taller and the forest was more open.

Products of the Jungle. Back at the pier, dark-skinned Indians with straight black hair were loading odd-looking chunks of some blackish substance onto the steamer. Miguel said this was rubber. Miguel's father was a rubber merchant, so the boy could tell Joe much about this jungle product.

Black Star

Giant anteaters poke into ant's nests with their long, narrow snouts.

The rubber trees grow wild in the forests, and yield a milky juice from which rubber is made. Rubber is the chief product of the Amazon Basin. Natives go into the forest and cut downward-slanting gashes in the trunks of these rubber trees. Beneath the gashes, they hang little cups into which the juice runs. These cups are emptied into pails, and the pails are carried to a fire.

A paddle is dipped into the juice, and then this juice is scraped from the paddle unto a pole which is kept turning in the smoke over the fire.

The heat thickens the juice and makes it hard. More and more juice is added to the lump on the pole until a rubber "ham," as it is called, has been made.

The hams are sent down the river to Belém or up the river to Manaos. From these cities they are shipped to other countries. These two cities are important rubber ports.

Though some rubber is raised on plantations, most comes from the forests. The traders go up and down the streams in small steam launches or gasoline motorboats and buy rubber from the natives.

Ewing Galloway, N. Y.

The latex, or sap, of the rubber trees flows from these cuts.

In return, they give the natives such things as hatchets and knives, candy and canned goods, and even phonographs, with which the natives are much pleased. When the flood season comes, the rubber gathering stops, and most of the white men go to Belém or other cities to get away from the dampness of the jungle.

Besides the rubber hams, large, round, brownish balls were being loaded onto the steamer. Joe felt one of them. It was very hard. "What are these?" he asked.

Miguel grinned. He looked around until he found a hatchet. Then he set one of the balls on the pier floor and chopped it open through the center. Out tumbled a big handful of odd-shaped nuts. They had been packed tightly inside.

"Brazil nuts!" exclaimed Joe. "One of my favorite nuts! What else do they get along the river, Miguel?"

"Mostly palm nuts for their oil, and lumber," answered Miguel.

"Dad is here for lumber," said Joe. "He uses mahogany and rosewood and a little balsa wood."

Living Along the Amazon. On they steamed, up the great river. They stopped every so often at some small settlement to let off passengers. At night they slept under mosquito netting, for protection against dangerous insects. It was steaming hot. Joe could understand why everyone took a nap after lunch.

One morning, they tied up at a pier to load lumber. As they were to stay some hours, Mr. Wilson decided to visit a little lumber settlement a few miles upstream. He took Joe and Miguel with him. They traveled in a native dugout paddled by four Indians.

At the settlement, they visited the house of one of the Indians. The hut was built on poles, high above the ground, because of the danger of floods. The frame was made of poles firmly lashed together with vines. The roof was made of large palm leaves. One side of the hut was covered in the same way.

The children climbed a ladder to the hut. On the floor were mats to sit on.

Hammocks, woven from vines, hung from the wall posts. Clay and wooden kettles, and the hard shells of a fruit called *gourds,* served as dishes. Food was cooked by heating stones in a fire and then dropping the stones into kettles holding food and water.

Joe was especially interested in the bow and arrows and a blowgun that hung on one wall. He learned that the natives hunt the dangerous animals of the forests with guns or bows and arrows. Sometimes they use a blowgun. A blowgun is a long tube like a giant pea-shooter. A poisoned dart is put in the tube. Then the hunter blows into one end with all his might and drives the dart out at the other end. The blowgun is a deadly weapon.

Near the hut, Indian women were digging up a new garden tract with pointed sticks. In an older garden, manioc—or *cassava*—sweet potatoes, corn, beans, and sugar cane were growing. Joe learned that the rain forest and the rivers supply the natives with much food. When they want meat, they kill some animal, such as a peccary. The peccary is somewhat like a pig, and the natives like its meat.

When they want fish, they throw branches of a certain bush into the shallow streams and beat the branches with sticks. The juice of the bush gets into the water and deadens the fish. The natives then gather them in. The fish are still good to eat, for the juice does not hurt the meat.

If a native wants fruit, he has only to pick it. Many kinds grow wild in the jungle. The roots of the cassava plant take the place of our potatoes and bread. Tapioca, from which we make puddings, comes from the cassava plant. Because the climate is always warm, food plants are usually plentiful throughout the year. Since food does not keep well in such a hot climate, it is a good thing there is no need to set aside food for cold weather.

Mr. Wilson, Joe, and Miguel walked a little way along a trail. A native boy tagged along behind. Joe admired the beautiful orchids that grew wild on some of the trees. His father said that a single one of these blossoms might sell for several dollars at home.

They turned a corner and surprised a young armadillo in the path. It was covered with tough, hard skin that looked like armor. At sight of them, it rolled up in a tight ball with the armor outside. Miguel picked it up, saying, "I think I'll keep it as a pet."

Just then Mr. Wilson glanced upward. He said quietly to the boys, "Step back along the trail. Go easy."

Brazil nuts grow in the forests of the Amazon Basin.

Brown Brothers

Black Star

Amazon Indians spend much time weaving things both for trade and for their own use.

As he spoke, the Indian boy gave a shriek and ran yelling down the trail. From the little settlement, cries answered him. Miguel looked up. "An anaconda! And right over the trail!"

Then Joe spotted a huge, slowly moving creature. It was coiled around a stout branch. Along its back was a double row of large black spots. Then came a pointed head and a flickering tongue. Joe realized he was looking at a snake that was larger than he imagined could exist. Its body seemed as thick as his own waist.

Back down the trail sounded calls. Two Indians swung around the curve, carrying their blowguns. They stopped in their tracks at sight of the great snake. Each took from a little pouch a poisoned dart and slipped it carefully into his blowgun. Then the guns were aimed. The men drew deep breaths. There were faint streaks of light as the darts flew to the mark. Other darts followed. The anaconda's head jerked back. The mighty coils loosened. Slowly the great snake dropped to the trail.

"Phe-ew!" Joe wiped the moisture from his face. "I don't think I'd like hiking in this country."

The Indians straightened out the snake on the path. Mr. Wilson measured it with a pocket rule. "Twenty - nine feet," he announced. "That's big enough for me, although they have been found longer. The ordinary boas grow to about twelve feet."

The travelers left most of the Indians rejoicing at their victory over the snake. It might have entered one of their huts some dark night.

The dugout carried them back to their steamer. Three days later they steamed into Manaos, a city of 100,000 inhabitants and an ocean port for jungle products.

A couple of days were spent in the hot city, one thousand miles from the sea. Then Joe said good-by to Miguel, and he and his father took a small plane back to Belém.

On the way, Mr. Wilson talked about the country of Brazil. It had many regions that were higher and cooler. Here there were great coffee plantations. There were many mines also, and great cities along the coast. Rio de Janiero is one of the most beautiful cities in the world.

The next day they left Belém for home. Joe could hardly wait to get there. He would have so much to tell his friends at school.

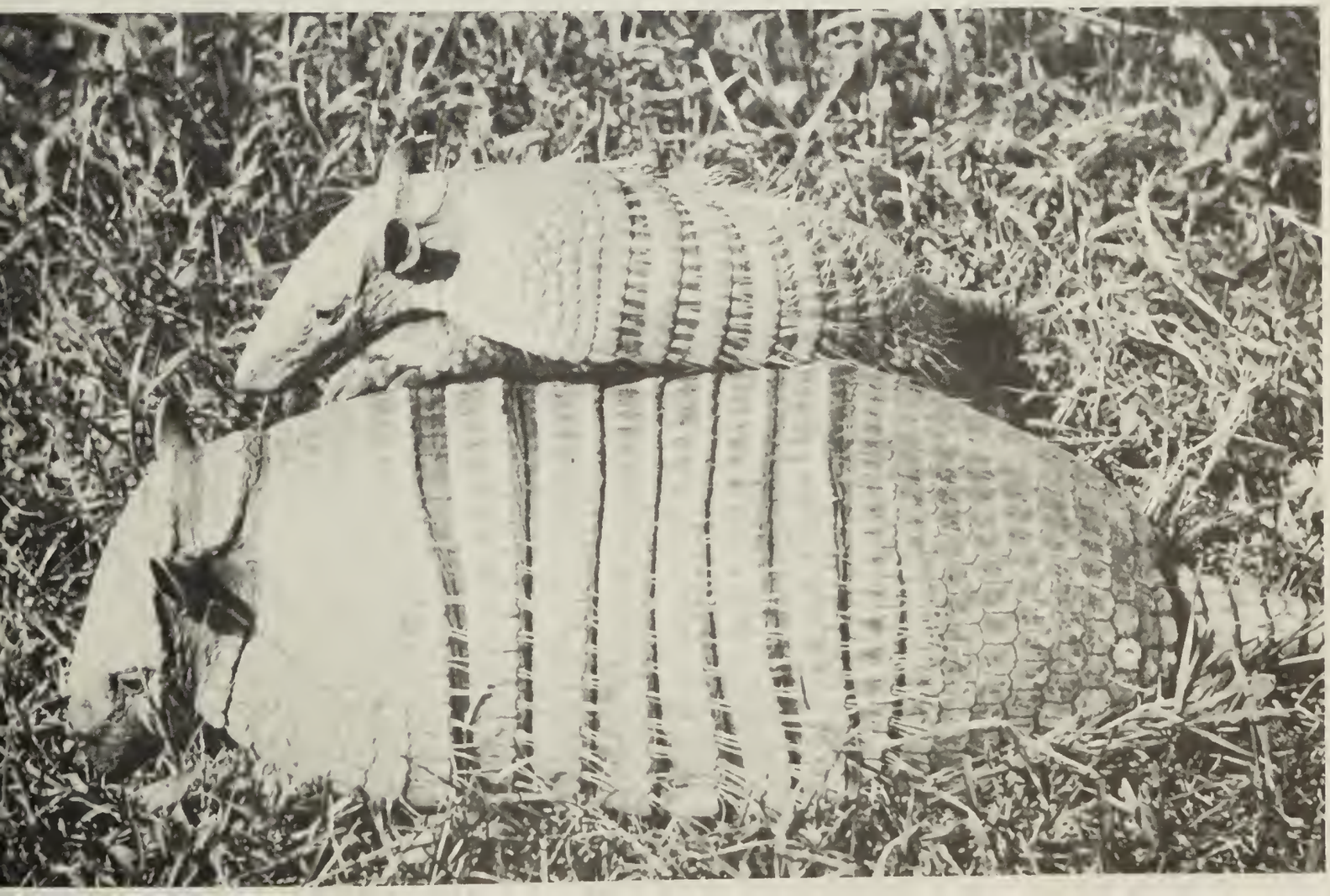
OTHER HOT, WET LANDS AROUND THE WORLD

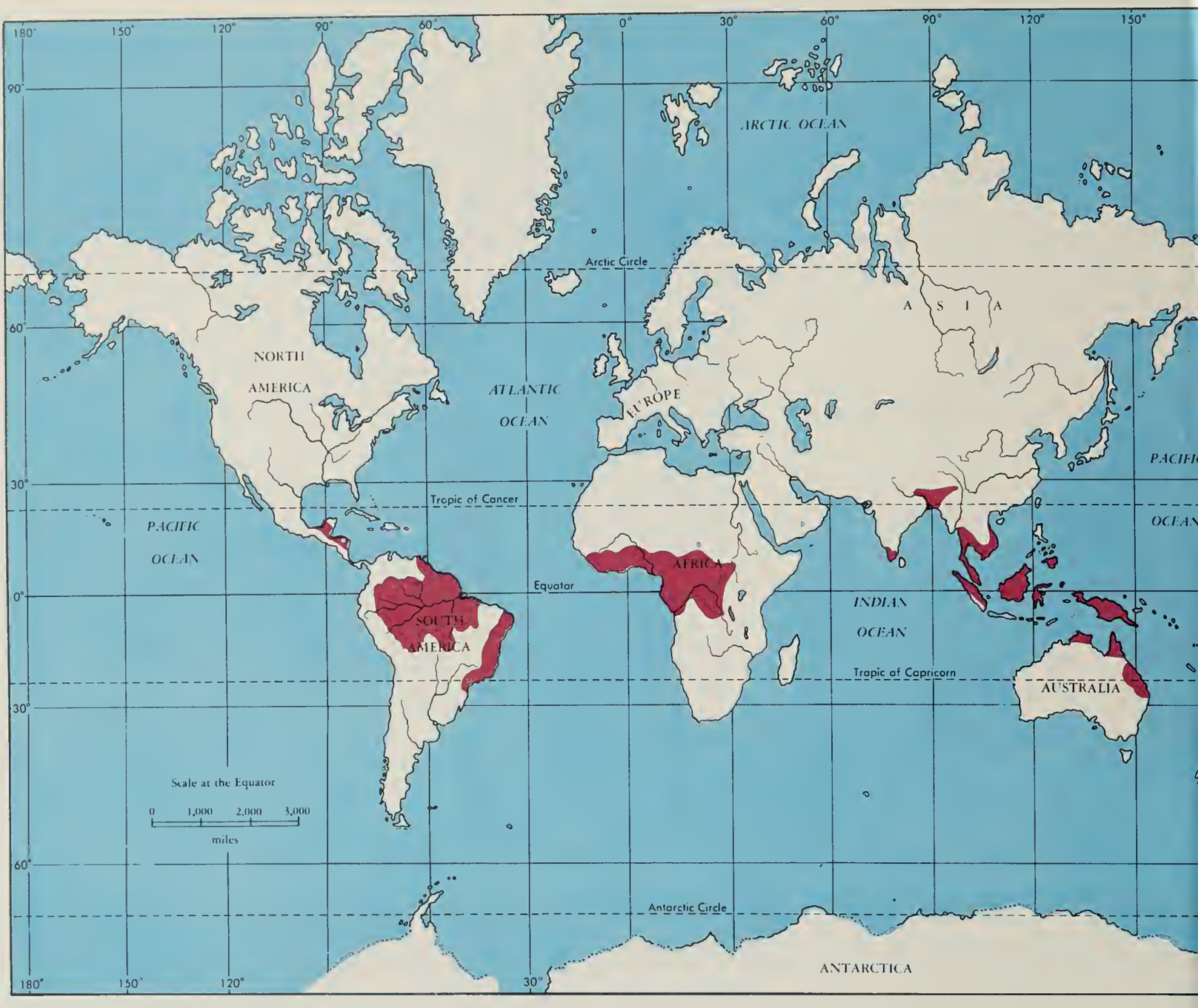
The Amazon Basin is very hot and rainy. It has mighty rivers and dense forests filled with dangerous wild beasts. Look at the map and you will see other lands in Asia and Africa which will make you think of the Amazon Basin. They, too, have dense rain forests and are very hot.

The Congo Basin. The greatest of these areas is in Africa. It is called the Congo Basin. The Basin is about half the size of our United States. It is not quite as hot as the Amazon Basin, although the Equator passes right through it. The Congo Basin has many great rivers. Most of these unite to form

Protected by its armor, the Armadillo can live safely with larger animals in the forests.

Victor De Palma, from Black Star





A map of hot, wet lands around the world

a mighty river, the Congo, which is about 2900 miles long. Its rain forests are as dense and tangled as those of the Amazon. The air is very moist.

Insect and Animal Life in the Jungle. As in the Amazon Basin, the tree growth is so thick that sunlight rarely reaches the ground. Swarms of insects make a constant humming sound. There are poisonous flies and mosquitoes whose bites cause sickness and disease.

Huge ant hills house millions of ants—white, red, and black. The white ants are very destructive, eating almost everything. One kind of black ant is very dangerous. They travel in swarms, and fall upon mice and snakes and any small animal that crosses their path. Even the large animals fear them and keep out of their way.

Poisonous snakes are to be guarded against everywhere. A giant snake, the python, that crushes animals or people in its folds, grows to a length of 25 feet. Leopards prowl along the animal trails or leap from low branches to seize and devour passing animals.

Black Star

Giant ant hills built by the white ants of Africa

The gorilla, an ape larger than a man, makes its home in the forests, but lives mainly on the ground. The baboon prefers rocky ground to trees. Monkeys leap from branch to branch overhead, chattering madly. Parrots and large parrot-like macaws flutter and squawk among the branches. There are many other birds with brilliant plumage, and there are gorgeous butterflies.

Along the rivers live the hippopotamus and the crocodile. The hippopotamus is a large animal with an immense body and short legs. It has a very large mouth which it can open as wide as a yardstick is long. It is very nearsighted.

The hippopotamus lives in herds and spends much of its time in the water. It comes out mostly at night to feed on plants near the shore. When alarmed, the hippopotamus dives under the water and swims for some distance before it comes up again. The natives hunt the animal for its meat. This is dangerous work. If hunted in the water, the hippopotamus may rise under the canoes, upset them, and attack the hunters.

The crocodile is much like the alligator of the Amazon. It lives mostly in the water, and gets its food by seizing and eating animals which come down to the shore to drink.

In the brushlands, and in clearings near the edges of the jungle, roam herds of enormous elephants. They are a terror to the farmers of the forest, because they like the garden plants and often trample down and ruin what they do not eat. The natives hunt them for their long, white tusks of valuable ivory, and for

Ewing Galloway, N. Y.

The hippopotamus is at home on land or in the water.

Enormous elephants roam the brush lands, often ruining farms that lie in their way.

Brown Brothers

their meat. Elephant steak, so the natives think, is delicious.

The rhinoceros lives in the same regions, but prefers marshes and tall grass, for it lives on grass and roots. It is a huge, black creature with a big body and short, stout legs. Its thick skin is in great folds. You might almost believe that it was clad in armor. It has a thick neck and a long, ugly head. Its weak eyes are small and set far down near its nose. Two thick, ugly horns grow, one behind the other, from the top of its nose. When attacked, the rhinoceros lowers its head and rushes forward. With its horns it rips open its enemies, and then tramples them with its heavy feet.

Natives of the Forests. The natives of the forests along the Congo are Negroes. In villages deep in the forests are their low huts, which have sloping, grass-covered roofs. These natives chop down trees and clear the land around their

H. Armstrong Roberts

The giant gorilla makes his home in the forest.

The ugly rhinoceros charges its enemies and rips them with his sharp horns.

Ewing Galloway, N. Y.

homes in order to raise vegetables. Potatoes, grains, rice, and sugar cane are their most important crops. Bananas and other fruits which grow wild are part of their food. Sometimes they kill a jungle animal and eat its meat. They also spear fish for food.

The natives live busy lives. The women carry the firewood, cook the meals, and care for the crops. The men and boys fish, hunt, gather fruits and wild honey, and make tools, knives, and weapons from iron. Many gather products of the jungle which they can trade with the white men for things they need. Many work on plantations.

Some of the natives weave grass mats and clothing. Some make earthen bowls. Besides earthen bowls, the natives use the hard shells of gourds as cups or dippers.

Sometimes the whole village goes into the forest to hunt. That, perhaps, is the busiest time of all. For, while some hunt, others must cut up the meat and smoke it in order to preserve it. Even the little children gather wood and help keep the fires going.

Bows and arrows and spears of their own making, or rifles obtained by trade, are the weapons used. To capture large, savage animals, the natives sometimes dig deep pits. They cover these with light branches and leaves, so that the covering looks like the surrounding ground. When an animal steps on this covering, it gives way and down he goes to the bottom of the pit, from which he cannot escape.

The Pygmies. Probably you would find the Pygmies the most interesting of the Negro tribes of the jungle. They are very, very small people. A full-grown Pygmy man is only about four feet tall. How does that compare with your height?

Because they are small, the Pygmies find it easy to make their way through the thick jungle. They are great hunters. Armed with spears, and with bows and poisoned arrows, they are not afraid to attack the fiercest jungle creatures. Wild fruits, roots, and meat are their chief

Three Lions

Large ships are repaired in the dry-docks at Leopoldsville.

foods. In exchange for vegetables, they sometimes trade ivory and other things with the larger Negro farmers.

White Men in the Congo. The Congo is not a healthful region for white people, and the white population is not large. At first the white men went to the Congo for slaves and ivory. But soon they discovered that the rain forest could yield many valuable products. Some of these products grew wild. Others could be raised on plantations under the direction of the white men. Most of the laborers are paid with cotton cloth, food, tools, weapons, dishes, beads, and other things they need or like. Many small towns and trading posts have sprung up. The largest city has only about 40,000 people.

Products of the Congo Basin. The forest products include palm oil, largely used in making soap; palm nuts; rubber; cacao; copal gum; and ivory. The wild rubber is found in vines and not in trees. However, there are rich plantations of rubber trees. Coffee, sugar, bananas, and cocoa are also raised on plantations.

Then there are the products of the mines. Copper is the most important. Diamonds, gold, tin, silver, and radium are among other products mined.

Travel and Transportation. How, in this dense jungle land, can people and goods be moved? There are immense areas of jungle where there would be little or no travel, except for the many streams and the dugouts of the natives. Along the Congo and its main branches, it is a

Three Lions

One of the major means of transportation in the Belgian Congo is the covered boat.

different story. Hundreds and hundreds of steamers puff up and down these rivers. The Congo is deep enough for river steamers for a thousand miles. True, there are rapids here and there. At such points, goods are carried around the obstructions, by rail or truck, and loaded onto another steamer beyond.

There are hundreds of miles of railroads and several thousand miles of roads. On many of these roads, automobiles can be used. Of course there are airplanes. Since it is difficult and very costly to build airfields in jungles, the planes are equipped with floats so that they can land on the rivers. So you see, even the jungle cannot always stop modern means of work and travel.

Hot, Wet Lands of Asia. If you will follow the Equator on around the world, you will find it crossing islands just south of Asia. The Tropical Zone covers the lowest tips of the continent of Asia. Look on your map for the Malay Peninsula, and the large islands of Sumatra and Java. You would expect these regions to be hot and moist. Why? But they are also partly mountainous. It is in their lowlands that we would find the steaming, dense, wet jungles, like those of the Amazon. There are, also, many rivers.

In these jungles, too, the natives live much as they do in the other jungle regions you have studied. They gain their food from jungle trees, from wild bees' nests, and from hunting and fishing. They have dangerous creatures to guard against—many kinds of poisonous snakes, leopards and panthers that steal their

goats, and on the mainland wild elephants that trample down their little gardens. There is also the dangerous striped tiger, master of the jungle life, that preys on wild and tame animals and often turns man-eater.

In southeastern Asia we also find large rubber plantations where many natives work. This is one of the greatest rubber-producing regions in the world.

You will notice that all the rain forests are hot and wet. They all lie in the Tropical Zone near the Equator. Their animal life is different, but in many other ways they are much alike.

H. Armstrong Roberts

Notice the native boats on this tropical beach

QUIZ QUESTIONS

1. Describe the climate of the rain forest.
2. How did Joe and his father travel to South America? At what city did they land?
3. Tell about the mouth of the Amazon.
4. What is the bore of the Amazon River?
5. What are three things you should remember about Belém?
6. Are the noon shadows longer or shorter near the Equator than in our own land?
7. How long is the Amazon River? How wide is it at Belém?
8. What is the Amazon Basin?
9. Why is there so much rain in the Amazon?
10. Why are there not many highways or railroads in much of the Basin?
11. Describe the rain forest in the Amazon.
12. Name five animals that live in the Amazon rain forest.
13. Name three products of the rain forest that are used in our country.
14. What three kinds of lumber from the Amazon Basin did Mr. Wilson use in his factory?
15. Describe an Indian hut.

Philip D. Gendreau, N. Y.

The dangerous striped tiger, master of the jungle life, preys on other animals and sometimes even turns man-eater.

16. Where is the Congo Basin?
17. Tell about the insect life in the rain forest.
18. Why might people go to the Congo Basin or any other rain forest?
19. How are the Congo and Amazon Basins alike?
20. What important product is found wild or is raised in the rain forests?
21. Tell about the tiger.

MAP EXERCISES

1. Trace the largest river on the globe. Point out three of its longest tributaries.
2. Point out all the rain forests on the globe.
3. Compare the map of rain forests on page 108 with the same areas on the globe.
4. Trace the Congo River on the globe.
5. Where does the Amazon cross the Equator?
6. Does the Congo cross the Equator?
7. Find on the globe the imaginary line which runs through all of the rain forests.

CAN YOU MAKE A MAP MODEL?

With a mixture of ½ flour, ½ salt and a little water, make a plastic map of:

South America and the Amazon River
Africa and the Congo River.

If you mix poster paints with the plastic mixture, you will be able to make beautiful maps.

SOME THINGS TO TALK ABOUT

1. Animals of the rain forests
2. Travel in the rain forest regions
3. How wild rubber is prepared for shipment in the Amazon jungles.
4. Native life in the rain forests

Arthur L. Child, from Black Star

This giant kudu is called the handsomest antelope in the world.

Weldon King, Freelance Photographers Guild

The grassland farmer's wealth is measured by the number of his goats or cattle.

Unit VII

THE HOT, LOW, GRASSLANDS OF AFRICA

You must not think the Tropical Zone is all rain forests, such as those of the Amazon and the Congo basins. The growth of these forests depends on heat and rains all the year. But north and south of the jungle are very different lands.

Northward from the jungle of the Congo Basin, the trees and vines grow less and less dense. Finally natural grass-covered clearings appear. Then come grasslands and patches of woods, mostly along streams and lakes. The trees become fewer and fewer. At last they practically disappear, except for low, thorny growth. Rich grasslands extend as far as the eye can see. Much of this grass is very tall. As you look at it, it waves and billows under the wind. It makes you think of the sea. If you went far enough north, you would find the grass growing thinner and thinner until you came to a new kind of land.

This region is known as the low grasslands of Africa. From east to west it is about as wide as our country. In size it is about two thirds as large. The grasslands lie wholly in the Tropical Zone. They have only two seasons—the rainy season and the dry season. During the rainy season the air is moist. The sun is almost directly overhead and the heat is

Burton Holmes, Ewing Galloway, N. Y.

Berbers pasture their sheep on the northern edge of the grasslands.

terrible. Heavy showers fall daily and the streams overflow. The grass grows fast. Then follows the dry season. The sun is now farther south in the sky. Dry winds blow in from the hot deserts to the north. No more rain falls. Soon the smaller streams dry up. The ground becomes caked and hard. Even the grass turns to hay where it stands.

The People of the Grasslands. The grasslands of Africa are also known as the Sudan. Most of the people living in the grasslands are Negroes who live in tribes. Each tribe has its king or chief. Because the climate is so hot, the natives need very few clothes. Strips of cotton cloth worn about the waist, or aprons or petticoats of cowhide or grass, are enough for them. They like heavy ornaments made of copper. Some wear many heavy rings of copper wire around their arms or legs or necks.

In the southern part of the grasslands, most of the natives are farmers. They live in little villages of houses with mud or grass walls and grass roofs. Many of the houses are round and have high, domelike roofs. On the land around the villages, the natives raise beans, corn, sweet potatoes, pumpkins, peanuts, and bananas. They raise two other valuable plants. One is durra, a kind of sorghum. The other is cassava, the roots of which are ground into flour for bread. The gardens supply most of the food for the natives, for they seldom eat meat. They raise few animals, and not many of the wild beasts in their part of the grasslands make really good food. However, the fishing is good in the streams.

To provide a means of food storage, the natives make great mud jars. These people are far more civilized than the jungle tribes.

The tribes which live on the northern edge of the grasslands, near the desert, are *nomads,* or wanderers. With their flocks of goats, sheep, and cattle, they move from place to place in search of good pasture land. Their principal foods are milk and meat, which they get from their flocks.

Many of these nomad tribes raise camels and sell them for beasts of burden, for travel, and for other purposes. The nomads drink camel's milk, weave cloth from camel's hair, and use the skins to make many things.

A Wonderland of Animals. How you would enjoy seeing the many animals which live in the Grasslands! In traveling through this region, there are few times when many kinds of wild animals are not in plain sight. There are the zebras, which look like small horses with stripes of black and white. The antelopes are almost countless in number. There are many kinds of these graceful deerlike animals. Some are large as you can see on page 118, and others are the size of a small dog. The zebras and the antelopes are very shy, and it is hard to get near them.

The long-necked, spotted giraffes are, perhaps, the strangest looking of the grassland animals. They are so tall and their necks are so long that they can eat the tender leaves on the topmost branches of small trees. They seldom eat grass.

The lion, the "King of Beasts," prowls through the grasslands. He kills antelopes and zebras, and attacks the many herds of cattle. Now and then a lion becomes a man-eater, spreading terror among the natives. In spite of their fear, the natives hunt lions with spears and lances. The hunters go out in large numbers. If they come upon a lion, they try to form a wide circle around it. Gradually they make the circle smaller and smaller with the lion at the center. When close enough, they rush in and destroy their enemy.

Two other animals are found in the southern part of the grasslands. One is

Because of their stripes, zebras can hide from their enemies in the tall grass.

Philip D. Gendreau, N. Y.

H. Armstrong Roberts

The lion, often called the "King of the Beasts," kills antelopes and zebras, and attacks herds of cattle.

the rhinoceros. It gives little trouble if left alone. The other animal is the elephant. Herds of these great creatures wander through the richer lands. Sometimes they break into the gardens of the natives at night and eat or trample the crops the natives worked so hard to raise. If frightened, a herd of elephants may dash through a native village, wrecking everything in its path.

Sportsmen from all over the world come to the grasslands for the hunting. Some people also come, from time to time, to capture animals to sell to zoos.

OTHER GRASSLANDS OF THE WORLD

Grasslands of many kinds are found in the tropical and temperate climates around the world.

South of the Congo Basin are large grasslands where there is also a very wet and dry season. These lands, however, are higher than the northern grasslands and are not as hot. The southern part of these grasslands has a temperature somewhat like that of the grasslands in our western plains. White people live comfortably in this region.

In the northern part of the southern grasslands, the native tribes raise wheat and corn and have herds of cattle. As one goes south, the climate becomes drier and the grass thinner, and there are scattered low, thorny trees. Sheep and goats are pastured here. The southern grasslands are rich in minerals, especially copper.

In the wilds, grass-eating animals abound, including countless numbers of antelopes. Other animals similar to those of the hot grasslands are found here.

North of the Amazon Basin in South America also there are rich, hot, grasslands, somewhat like those north of the Congo Basin. These plains are known as *llanos*. The land lies at different levels. Cattle are raised here in great numbers. Some sheep are raised also. In the rainy season, when the low valleys are flooded, the herds are driven to higher land. In the dry season, they are brought back to the lowlands.

South of the Amazon in Brazil is another somewhat similar grassland. It, too, is a land of great cattle ranches. Here are no railways, cities, or highways. The main buildings one sees are the groups of ranch houses. Cowboys drive the cattle hundreds of miles to the railroads and city markets.

The long-necked, spotted giraffes eat leaves from branches of trees, seldom lowering their necks for grass.

Philip D. Gendreau, N. Y.

Philip D. Gendreau, N. Y.

Indian nomads raise flocks of sheep.

In the southern part of South America, overlapping parts of Argentina and neighboring countries, are rich grasslands. These lie in the Temperate Zone and have four seasons, somewhat like our western plains. Many of the great cattle and sheep ranches are enclosed with wire fencing. Roads and railroads make it fairly easy to ship wool and stock to market. Still the cowboys have plenty to do. Their clothes and hats are different from those of our cowboys, and they ride fine horses. The people living here belong largely to the white races.

Traveling on around the world, we come to Asia. In north central Asia lies a great area of grassy plains. In some sections, the land is excellent for raising wheat and other grains. A large part of these plains, however, is used for grazing. Some of the people of these plains are nomads, wandering from place to place, and stopping where good pasture land is found. They have large herds of sheep, goats, and horses. They live on milk and meat. Another people, the Cossacks, live in small villages. They raise a few crops and tend their herds. They are known as splendid horsemen.

In the southern part of Asia lies the great land of India. It has areas of hot grasslands much like those of South America and Africa. Yet there is one great difference. There are so many people in the country that every possible bit of land must be used to raise crops. There are no great stretches of grass as in the wilder regions you have studied.

In the island continent of Australia, the grasslands form an immense belt lying partly in the Tropical Zone and partly in the South Temperate Zone. Later you will learn about the life in this region. By this time, it must be very clear to you that grasslands cover a considerable part of the earth's surface and form the great stock-raising regions.

QUIZ QUESTIONS

The Hot Grasslands

1. Where are the hot, wet grasslands of Africa?
2. In what zone are the grasslands?
3. Tell about the seasons in the grasslands.
4. What other name is given to the grasslands?
5. Tell briefly about the natives of the northern grasslands.
6. How does the life of the natives of the southern grasslands differ from that of the northern tribes?
7. Name several crops the native farmers raise.
8. Which are most common in the grasslands—grass-eating animals, or meat-eating animals?
9. Name several grass-eating animals found here. Name one meat-eating animal.

Other Grasslands of the World

1. Where are the southern grasslands of Africa?
2. How do these grasslands differ from the northern grasslands?
3. What are important products of the southern grasslands?
4. Locate and tell about the tropical grasslands of South America.
5. Where are the cooler grasslands of South America?
6. How does ranching here differ from ranching in the tropical grasslands?
7. Tell about the northern grasslands of Asia and the people who live there.
8. In what ways do the grasslands of India differ from the northern grasslands of Asia?
9. What other continent has extensive grasslands?
10. What is the main occupation of the grasslands natives all over the world?

MAP EXERCISE

1. With the help of the map on page 112, locate the main grassland of Africa.
2. What mountain ranges lie to the west of the grasslands of South America?
3. What mountains lie north of the Indian grasslands?

SOME THINGS TO TALK ABOUT

1. The life and homes of the farmers of the hot grasslands of Africa
2. Wild life in the African grasslands
3. The grasslands I would like to visit
4. A comparison of the jungles and the hot grasslands

Ewing Galloway, N. Y.

This camel caravan is passing a date grove on the northern edge of the Sahara Desert

Black Star

There are mountains even in the great Sahara.

Unit VIII

THE SAHARA DESERT, A HOT, DRY LAND

Do you remember that the grass in the northern grasslands of Africa grew thinner and thinner as you traveled north? If you continued in the same direction, you would find the sparse grass growing only in patches. In between would be stretches of sand. After a time you would come to sand that would seem to extend endlessly before you. This area is not a flat waste, but has wind-shaped mounds and hollows. It seems as if some giant hand had tried to mold a stormy sea of sand. There is an invisible hand, the strong wind, that is forever shifting the sand into new forms.

When you reached these sands, you would be well within the Sahara, the greatest desert area in the world. This desert covers much of the northern part of Africa, except near the seacoasts. It measures 3200 miles in length by 1600 miles in width at its widest point, and is larger than our own land. Yet, immense as it is, it is but one of a belt of deserts that extends well into Asia.

If you continued north across the Sahara, you would discover that its surface is not all shifting sand. Far within its borders, you would come on ledges and plateaus of bare rock extending over

Screen Traveler, From Gendreau, N. Y.

Dates and a few plants grow in the oases—areas in the desert with springs and wells.

long distances. Perhaps you might come in sight of the great mountain ranges in the central portion. There are three of them, with peaks ranging from 6000 feet to 9000 feet in height. They are rock masses without tree growth. In the winter season, their tops are white with snow.

Probably you recall that in much of our western desert lands sage brush and cacti and other plants grow. There is little plant growth in the Sahara except on the fringes and at the oases. An *oasis* is a spot in the desert where there are springs and wells. There, plants grow well. But oases are far, far apart. Along the edges of the desert, quick-growing plants come up after a rain. They are eaten by the herds owned by the nomads of this region. There is little animal life inland, although some poisonous snakes are found.

Since the Sahara lies partly in the Tropical Zone, it is very hot by day, especially when the sun is close to the Tropic of Cancer. The nights are cool, however, for the dry sand cannot long hold its heat after the sun goes down. Usually the northeast trade winds blow from the dry sections of Asia and not from the sea. Terrific windstorms sweep over the region, blowing the sand in dense masses. Rains are rare, and come more frequently in the cooler season

when the sun has moved south of the Equator.

In these days, you might fly across the desert. From towns on the northern edge, you might travel some distance in automobiles. These machines run on special treads that prevent them from sinking into the sand. But, for the trip across the sea of sand, camels, the "ships of the desert," are commonly used.

As you will see later, you would find strange new conditions on such a trip. Like the ocean, this sea of rock and sand has no paths for you to follow. You would need men to guide you on the way. These men must know their way across a region whose surface is constantly changing its appearance.

There are no cities, and only a few small towns, for only a few people live in this whole desert. At times you would have to travel many miles without fresh water, for there are no rivers, lakes, or streams in the desert. Even wells or springs are often one or more days' journey apart. You must carry what food and water you need for yourself and your guides, and for the camels on which you will ride.

The Desert Dwellers. What about the desert dwellers? You begin to meet them as you come north out of the Grasslands. Perhaps several horsemen appear in the distance. They are tall men. After watching you for a while, they come nearer and greet you. They are riding small but beautiful Arabian horses and are armed with long rifles. The men themselves are clothed in long, loose robes of wool or camel's hair. They wear

Bedouins wander across the desert, searching for new patches of grass for their herds.

Publishers Photo Service

Villages are built up around the small fertile patches of an oasis.

cloth headdresses with strips of fine cloth that can be drawn over the face for protection against sandstorms. Your guide tells you they are *Bedouins,* a part of the Arab people. While they are burnt almost black by the Tropical sun, they are really white people.

These men, it seems, are nomads. They have been out searching for new patches of grass for their herds. They can grow no crops in the hot, dry land, but the grass supports herds of sheep, goats, donkeys, and camels.

The Bedouins live on camel's and goat's milk, on cheese, and now and then on the meat of a sheep. At intervals they take wool and camel's hair or an animal or two to the nearest oasis. There they trade their products for a little wheat, millet, barley, and dates.

If you visited their homes, you would find that the Bedouin nomads live in low tents of goat's or camel's hides, held up by a few poles set in the ground. Sometimes one side is left open for air. There are no beds or chairs. Mats and cushions take the place of these. There is no stove, for cooking is done over a fire on the ground outside. Only a few pots, pans, and dishes are used.

This way of life is necessary, for the nomads are constantly on the move to new grazing areas. The tent sections are rolled around the poles and loaded on a camel. All the other possessions are handled easily in small packages.

But if you wish to know what real desert life and travel are like, suppose you look in on Ibn, a boy whose home is in an oasis.

The Little World of an Oasis. All the eleven years of Ibn's life have been lived in a little fertile world. It measures about two miles long and one and a half

In desert lands, horses are used for speed while camels carry the heavier loads.

miles wide. Except for short rides with his father into the surrounding desert, this is all the land Ibn has ever seen.

Ibn's father is Sheik Ilbrahim. The word "sheik" means "chief." Sheik Ilbrahim is head of the little tribe of Arabs who live in this oasis. His word is to be obeyed by all. He is a good leader.

There are two little villages in the oasis, situated about a mile apart. The sheik lives in the larger village. His home, like those of his followers, is built of large clay bricks. They have been baked in the sun until they are very hard. The walls have doorways without doors and window openings without windows. In this hot, dry climate, there is little need for them. The roof is flat with the side walls rising above it. It is reached by a ladder. Here the family can come up to rest in the cool of the evening.

The house is simply furnished. There are rugs on the floor and cushion couches to sit on. There is a bench around part of the wall where people may sit or sleep. Rooms are formed by curtains of wool or camel's hair. Weapons are placed on pegs driven into the wall.

The house stands in the shade of tall date trees. Dates grow in bunches on these trees. They are the favorite fruit of the desert people. The trees grow and bear fruit for many, many years. It is said that they like best to grow with their heads in the hot sun and their feet, or roots, in cool, moist earth. Here in this oasis they get both.

Ibn walked down a path between rows of date trees. He passed a bubbling spring whose waters ran off in little channels to water the fields of wheat and millet, the grove of lemon trees, and the grape vineyard. Farther on was a well

from which water was dipped up in little buckets fastened to a belt. Camels tramped round and round the well, working the machine that kept the belt moving.

Outside the village, Ibn stopped at a *bazaar*. This is a sort of trading store, for the desert people have little use or need for money. At the open shop front, a group of Bedouins were trading sacks of wool and camel's hair, and half-grown camels for wheat and dates and a couple of iron pots. Coming in from the desert sands was a *caravan,* or train of camels, laden with goods from the outside world. The caravan would take back to some city the goods the keeper of the bazaar had obtained from the desert people.

At his Uncle Abdul's home in the second village, Ibn asked properly as to the health of his family.

"I hear," said his uncle, after all the correct greetings had been exchanged, "that you go with your father into the outside world."

"Tomorrow, before dawn, we shall start," said Ibn proudly. "Now I shall see the many strange things my father has told me about."

Indeed Ibn was greatly excited. His father was taking a long trip across the desert to the land of Egypt and the great river Nile. Ibn was going with him. To the boy, it seemed like a trip into another world.

The Trip Begins. Long before dawn next morning, Ibn was roused by his mother. The stars were still shining brightly. All was seemingly bustle and confusion. The camels were being led up from the spring where they had drunk deeply and long, to fill the special pouches within their bodies. They knew they were going on a journey. This water would last them two or three days. If food became scarce, they could live for a time on the fat stored in the humps on their backs.

Ibn grinned as he watched the pack camel that was to carry their personal belongings. It groaned pitifully when ordered to kneel to receive the load. As each piece of baggage was put in place, the camel whined and bellowed. Most camels, Ibn knew, pretended that they were being overloaded. They were sullen beasts, no matter how well they were treated. Even his own camel groaned when he climbed up on its back.

When the little caravan was ready, Sheik Ilbrahim, mounted on his famous white Arabian horse, took the lead. One camel carried food and water for the animals. The horse must have food and water regularly. The camels are better off if fed each day, although they can go without food for days if necessary.

With a final complaint, the camels rose swiftly to their feet and followed the horse. Ibn nearly pitched over his camel's neck. He saved himself just in time. Camels, you know, get up on their hind legs first, like a cow.

Sheik Ilbrahim led the way out of the village. He bowed gravely in response to the greetings and good wishes of a few of his neighbors who were up. Ibn wished the village children could have been up to see him off.

Presently they were passing the last of the grain fields and the camels paced faster. Ibn rolled on the cushioned saddle to meet the roll of the body under him. Camels do not trot like most horses, but put both right feet forward at the same time, then both left feet. Thus they

have a rocking motion that makes new riders feel "seasick". Ibn had ridden around the oasis enough to ride easily.

The camels made good time. Their large hoofs kept them from sinking too deeply into the sand. When Ibn turned at dawn, to look back, the tops of the date trees were just disappearing from view. All around were the shifting mounds and valleys of sand. Suddenly Ibn felt lonely and a little uneasy. He was glad that there were several men in the party.

With every mile the land seemed to grow stranger. The strong desert wind blew particles of sand in the faces of the travelers. They had to draw the cloths of their caps over all but their eyes for protection. The sun shot up from behind a sand billow. Instantly the chill of the night disappeared. It grew hotter and hotter. Ibn grew weary, but not for anything would he give a sign of it.

Suddenly in late morning, Ibn's father gave a signal and all stopped. The camels lay down. A light shelter tent was spread for the men. It was not best for animals or men to travel during the midday heat. That heat often reaches 130°. So they ate, rested, and dozed until late afternoon. Then they went on. The country grew wilder and rougher. Rock ledges appeared. Beside one was a small well.

On they went, rocky stretches alternating with rolling sand. It was wild country. There were no animals; they met no other people. Ibn somehow expected a great stillness. Yet it wasn't so, for the desert whispered to them. Countless grains of sand, moving over one another under the force of the wind, caused a

It is a long trip across the hot rolling desert of Egypt.

Brown Brothers

Desert travelers are on the watch for approaching strangers. They always fear robber bands.

faint murmur. The shuffling of the camel's feet added another note. Since the camels traveled "single file," that is one behind another, there was little talking among the men.

As the sun went down, a great blaze of color filled the western sky. First it was cool yellow, then gold, then pink, then red. The dust in the air makes the desert sunsets very wonderful. Ibn watched this one until it faded out. Velvety darkness covered them. Then the brilliant stars came out. Ibn tried to keep awake by looking for the figures formed by groups of stars, but he was sound asleep when the men made camp.

They were up again before dawn, and on their way. There was little change in the view. They passed one well, but it was dry. The third day they found a well of cool water. Ibn was beginning to tire from lack of special happenings. Then, on the fourth day, his father reined in and pointed. Miles away a line of black specks seemed to crawl over a sand hill. When it reappeared, the line had become a long caravan of tiny camels. In a half hour, they grew quite large. Then they stopped and huddled together.

Sheik Ilbrahim motioned his men to stop. He rode on alone. Out from the large caravan rode a man on a camel. They met in an open space.

"The caravan leader is afraid that we may be a robber band," Ali, one of his father's men, explained to Ibn. "Thy father has gone to set his mind at rest."

Evidently he succeeded, for the caravan came on. Its leader rode back with

the sheik to the latter's band. There they parted company, and the caravan passed on along a faint trail—one of the more traveled paths across the great desert. Ibn counted 24 heavily laden camels and four men on rider camels.

Sheik Ilbrahim did not follow, although he was to use the same trail. Instead, he ordered an immediate camp. The heat was very great. They would rest until dark and travel by night. That night march, under the brilliant stars and a new moon in its first quarter, was one Ibn would always remember.

The next morning they rested. In mid-afternoon, they started on. Presently, without warning, a band of horsemen dashed out from behind a rock ledge. Their horses, on a dead run, spread out to surround the sheik's band. One rider fired a shot. At once the sheik's men bunched the camels and ordered them to lie down. Ali ordered Ibn to lie on the sand close to his camel. "Robbers!" he said. "Keep your head down." About him, the other men were taking shelter and lifting their long rifles.

Ibn, however, could not resist a peek. What he saw seemed to make his heart stop beating. There was his father riding alone straight towards the robber band. "He may buy them off," muttered Ali. The figure on the white horse rode on, one hand raised.

Suddenly the leader of the charging horsemen waved a hand to his men. They reined in their horses so sharply their hoofs plowed up the sand. Their leader came on until he faced the sheik. Suddenly both raised their hands in friendly greeting. They came close and talked for a few moments. Then they bowed low. The robber leader turned away, motioned to his men, and all rode off as swiftly as they had come.

Sheik Ilbrahim rode slowly back. "It is good!" he said. "Once the opportunity was given me to help the leader in a desert accident. He has not forgotten. His men will not trouble us."

Ibn was proud of his father. He was excited, too. What a story he would have to tell his friends!

The next day, they rode into the town and oasis of Ghat. To Ibn it seemed like

The sandstorm blew with great strength over men and animals.

Philip Gendreau, N. Y.

An oasis town is often lined with rows of bazaars crowded with arguing and shouting customers.

a great city, though it had only 8000 people. It was a busy stopping point on the caravan routes. The streets were crowded with men of many Arab tribes. Ibn heard many speaking in words strange to him. There were rows of bazaars crowded with customers, arguing and shouting. Through certain streets, desert caravans came and went.

Ibn would have liked to stay another day. However, his father wished to go right on. He had planned to go to the coast by the regular caravan routes. There he would take a ship to Egypt. Now he decided to follow less-known routes across the desert direct to the Nile River. Since the region was unknown to him, he hired a guide to lead him from one well or oasis to another.

A Sandstorm. One day, they had a heavy shower. Because of the terrible heat, the raindrops dried up as soon as they touched the hot sand. Another day, Ibn noticed that the camels suddenly stopped eating. He heard a strange sound. It was the whistling of a strong wind. A sandstorm was coming!

Without waiting for an order, the camels lay down with their heads close to the ground. They closed their eyes and nostrils to keep out the sand. Hurriedly, Ibn and the men lay down close beside them, covered their faces, and waited.

The storm came closer and closer. The wind blew harder and harder. Ibn lifted his head for one brief glance. He saw great clouds of sand rolling towards him. Sand particles stung his face before he could cover up. Then the real storm struck. Ibn could hardly breathe, for fine dust worked under the blanket.

After what seemed an endless time, the wind gradually went down. The air became clear again and Ibn looked about. He threw off his protecting blanket with difficulty. It was weighted down with sand. He was partly buried in it. The trail which they had left in the sand was completely covered. The guide studied the land for a long time. Ibn was afraid that the man could no longer find his way. But at last he waved his hand and moved on.

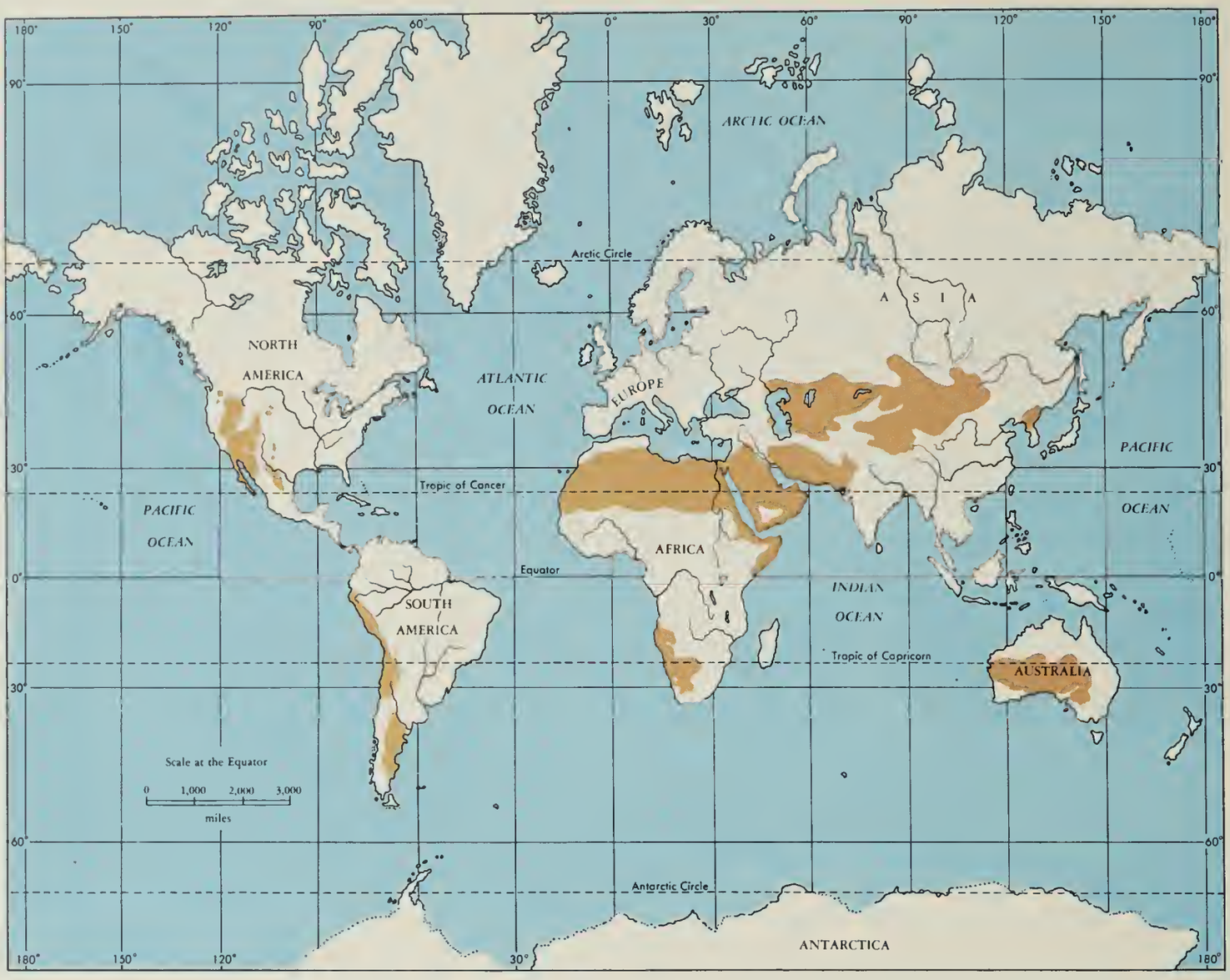
After that came days and days of travel. They seemed so much alike that Ibn lost count of them. There were drifting sands and rocky regions. Wells were a couple of days apart, sometimes dry. Now, at last, they came on patches of sparse grass and low, thorny bushes. The camels nibbled at them eagerly.

Soon they saw wild animals. Now and then, an antelope fled away before them. Doglike jackals barked at them from a distance. Great lizards sunned themselves on the rocks. At night, the ugly-looking, cowardly hyenas seemed to laugh wildly at them. Overhead great eagles floated high in the sky. When camp was made, the men had to look out for poisonous snakes, and *tarantulas,* which are large and deadly spiders.

Soon the worn and tired little caravan began to pass scattered herds of sheep

At night, the ugly, cowardly hyenas seem to be laughing wildly at campers.

Philip Gendreau, N. Y.



Deserts around the world

and goats. Finally, on the sixtieth day, Sheik Ilbrahim, reaching the top of a slight rise, stopped abruptly. He waved the others up, and pointed ahead.

Ibn reached him first. When he looked forward he could only stare. No words came. There was a wide rich belt of green and gold across the face of the desert. There were fields of growing and ripening crops. And running through their midst was a wide blue streak.

"The River Nile," said his father, gravely.

Ibn could only nod. Somehow he had thought of a river as perhaps a few feet wide. Never had he imagined that a stream could be so large.

OTHER GREAT DESERTS OF THE WORLD

There are many other large deserts in the world, but none of them are anywhere nearly so large as the Sahara. Some of them are quite different from the Sahara.

In the southern part of Africa, lying across the Tropic of Capricorn, is the Desert of Kalahari. It is higher than the Sahara and cooler, but lack of good wa-

ter keeps people away. There is some brush and grasslands, and Negro nomads raise small herds.

The Arabian Desert, east of the Sahara, in Asia, is a part of the countries of Palestine and Arabia. So hot and dry is this desert that more than a quarter of it has no inhabitants at all. The driest part, in southern Arabia, is visited only by a few Bedouins.

There are two other deserts in Asia. In the northeastern part of India is the Thar Desert, where there is no rain, but where the natives raise wheat and barley. A river, which rises in the mountains, flows through the Thar Desert. With its waters the natives irrigate the land. In China is the Desert of Gobi, more than two miles above the level of the sea, where the air is very cold.

The deserts of our own land, of which you have learned, are very small, compared with the great deserts of Africa and Asia. There are, however, long strips of desert land along the west coast of South America. Here the high Andes Mountains shut off the moist winds that blow from the east. Some of this desert land is rich in minerals. And finally, there is the Great Desert of Australia, of which you will learn later.

QUIZ QUESTIONS

1. Where is the Sahara? How does it compare in size with the United States?
2. Tell about the surface and climate of the Sahara.
3. In what different ways can one travel across the desert? Tell about conditions of travel.
4. What is the occupation of the dwellers near the edges of the desert, where there is little grass?
5. Tell about the life of the nomads. On what do they depend for food?
6. What is the most important fruit raised on the oases?
7. Name other crops grown on the oases.
8. What is a bazaar?
9. Tell about the "ships of the desert" and their habits.
10. Why is the start of a desert trip made before dawn? Why is a long rest taken during the middle of the day?
11. Why is it necessary to carry supplies of food?
12. Why are sunsets in the desert so beautiful?
13. Tell about robber bands in the desert.
14. What desert trading town did Ibn and his father visit?
15. Why are guides necessary for long desert trips?
16. Describe a desert sandstorm.
17. Tell about the animals and other creatures of the desert's edge.
18. What changes desert land to a rich land of growing crops?
19. Where is the Kalahari Desert? Tell about it.
20. Name three desert areas in Asia. Tell where they are. Which is the coolest?
21. Where are the deserts of South America located? What causes them to be dry lands?
22. Where are the desert areas of the United States located?

CAN YOU TELL

1. How the Sahara Desert is different from the Congo Basin?
2. How life on an oasis is different from life in the grasslands?
3. What you would like in a desert caravan trip?
4. What you liked best in the story of the Sahara Desert?

SUGGESTED ACTIVITY

1. On a sand table, show a portion of the desert and an oasis.
2. Make a model of Ibn's home.
3. Collect pictures of the desert and its life.

George Palmer, Black Star

Barges travel the Nile River, which flows the whole length of Egypt.

Unit IX

EGYPT

A DESERT COUNTRY MADE PRODUCTIVE BY A GREAT RIVER

To Ibn, the weeks of travel across miles and miles of hot sands and rocky wastes of the Sahara Desert had been a wonderful experience. He had come to feel a strange liking for the open desert. True, he had often longed for the date trees, the green crops, and the cool well water of his home oasis. The oasis had taught him what a little water could do. He wished the whole desert could have more water. Now, suddenly, he was to see what a mighty river could do to the thirsty sand. For though Egypt is a desert country, it has some of the most fertile land in the world. That is the gift of the Nile River, which flows through the whole country from south to north.

Sheik Ilbrahim put up his horse and camels at a little village of mud huts at the edge of the river. Here they could rest and regain strength for the hard trip home. Then the sheik took his son on the long trip north down the Nile Valley. To Ibn, it was like visiting a great new world. A steamer took them part of the way—the first boat of any kind that Ibn had seen. From its decks,

Although Egypt is a desert country, it has some of the most fertile land in the world. Can you explain this?

he saw other ships, and sailboats. Over them, airplanes flew gracefully.

Later they changed to a train. Not even Ibn's father had ridden on a train before. Finally, they reached a great city. The noise and confusion scared Ibn. He had not supposed there were so many people in the whole world.

Something of what Ibn saw and his father told him is given in the following story of Egypt and the Nile.

The River Nile. The Nile is the longest river in the world, although it does not carry as much water as the Amazon. It rises in a mountain lake of eastern Africa, far to the south of Egypt. From here, it flows swiftly down between the mountains. Then it flows more slowly through the plains until it reaches the desert. Here it twists its way through a long, dry valley, and finally empties into the Mediterranean Sea.

Owing to the lack of rain in this valley, the Nile has no tributaries on the last half of its journey to the sea. As it winds its way through the mountains, however, several large streams flow into it. They come from the fertile highlands of Ethiopia to the east, and from those of central Africa to the west of the Nile. During part of each year, these regions have frequent and heavy rains. The rains

wash the rich soil from the mountain slopes and the highlands into the streams. The streams carry the soil along in their swift race to the Nile River.

The Nile Valley. Down the Nile, the muddy water rushes until it reaches the valley in Egypt. Here it overflows the river banks and floods the land on both sides. Gradually the mud brought from the highlands settles. When the river goes down again, this rich soil is left in the valley.

These floods have been happening year after year, for thousands of years. Today there are anywhere from thirty to sixty feet of rich soil in the lower valley of the Nile. Fine crops are grown on this land. Beyond the valley, where the flood waters do not reach, there is desert sand and rock.

Screen Traveler, from Gendreau

The first great Aswan Dam fills irrigation canals and ditches as water is needed.

The Delta of the Nile. The mud which the river does not deposit in the valley is carried along to the sea. Here it has formed a wide delta at the mouth of the Nile. In this delta the Nile divides into many streams. Between these streams, long narrow strips of land reach seaward. This gives the delta the appearance of an open fan. As time goes on, more mud is added, and the delta continues to grow longer and extend farther out into the Mediterranean. The delta is now more than one hundred miles long. Abundant crops grow on its rich land.

Irrigating the Soil. Although the soil of the Nile Valley is very fertile, it would soon dry out from the hot winds of the desert if it were not kept moist. Thousands of years ago the ancient Egyptians learned to use the yearly flooding of the Nile to keep their lands watered. They built great pools, or reservoirs, to catch and hold the water when the floods came.

When the floods went down, the land began to dry out. Then the Egyptians let water from the reservoirs run into ditches which they had dug in the fields. The fields soaked up the water. In this

Black Star

Some Egyptians still raise water by the bucketful for irrigation.

way, the land was kept moist by irrigation.

In recent years dams have been built along the Nile. One of them, at Aswan, is among the largest in the world. Another, the Gabel Awlia Dam, is very long. It is over three miles long. These dams hold back part of the water during flood time. When the river is low, gates in the dams are opened and the water is let out into irrigation canals and ditches, as needed. These gates are near the foot of the dam, so that the mud which had settled flows out with the water and helps keep the land fertile.

The Egyptians have other ways of irrigation. Here and there along the river bank, one still sees a camel, a donkey, or a buffalo harnessed to a large, wooden water wheel. As he travels round and round a circular path, the wheel is kept turning. Buckets on the rim of the wheel dip up water from the river and pour it into troughs, from which it runs into the irrigation ditches.

In some places, the water is dipped up in buckets by hand. The buckets are passed to men higher up on the bank, who pour the water into the ditches. These methods were used by the early Egyptians, thousands of years ago.

What Water Means to Life. Egypt shows us how important water is to human life. A few miles out in the desert, where there is no water, few plants can grow, and no one lives. Along the valley of the Nile, where there is water, crops are rich and abundant, and the land supports many people. There are numerous villages, and some cities and towns. This part of Egypt is more crowded with people, for its size, than any other nation in the world. If it were not for the life-giving waters of the Nile, the valley would be a desert waste. You see that the very lives of the Egyptians depend on the great river. No wonder they call it "Father Nile!"

Buildings of the Early Egyptians. From very early times, the Egyptians have

Publishers Photo Service

The Sphinx and Pyramids remind modern Egyptians of their ancient kings.

been civilized people. Scattered throughout the Nile Valley are huge ruins of beautiful temples built by them thousands of years ago. The huge, tall, round stone columns that once held the roofs are still standing.

Travelers of today visit the pyramids, the tombs of the ancient Egyptian kings. These are enormous stone buildings, square at the bottom and pointed at the top, with triangular sides. Then there is the Great Sphinx, a giant stone statue of a creature with the body of a lion and the head of an Egyptian King. The Great Sphinx is more than two hundred feet long and over sixty ft. high. The paws are the only part not carved from solid rock.

Egypt Today. Along the Nile today are many villages in which the peasant farmers, or *fellahin,* live. Their houses are mud huts or are built of sun-dried brick made from clay brought down by the Nile. The low roofs are of straw or palm leaves plastered with mud. For the most part, the houses have but one room. Inside are a few mats on which to sleep, and some earthen jars and metal pots.

Cooking is done out-of-doors over a small burnt-clay stove. The food usually consists of vegetables, eggs, dates, and little cakes of coarse bread made from corn, rice, or wheat. Almost every village has its date-palm trees.

Publishers Photo Service

Almost every Nile village has its grove of date-palm trees.

The farmers keep a few sheep, goats, and chickens. Donkeys, camels, and buffaloes are used to carry goods, and to draw water and plow the fields. The buffaloes look much like cattle. They do not look like our American buffaloes which are really not buffaloes at all, but bison.

The farms are outside the villages. Cotton, corn, rice, and sugar cane are grown in the summer. Egyptian cotton is of fine quality. In the winter, wheat, barley, and vegetables are raised. Seasons do not mean much to the Egyptian farmers, for it is warm the year round. It is the water from the Nile that means everything, for without it there would be no crops.

The peasants dress very simply. The men wear short cotton trousers which reach halfway below the knee. Over these, they have a long robe or gown of the same material. A felt cap, or fez, with sometimes a cloth twisted about it, is worn on the head. The women wear long, loose gowns. These, too, are of cotton, and are usually white, or blue, as are those of the men. The women wear scarfs over their heads.

Climate. Egypt lies partly in the Tropical Zone, and partly in the North Temperate Zone. Even in the northern section, the summers are hot and the winters very mild, so that heavy clothing is seldom needed. While in most of Egypt the sun is never directly overhead, it is higher than it is in most of our country, and the hours of day and night are more nearly equal.

Cairo. The cities of Egypt are in some ways like those of our country, but in other ways are vastly different. The capital city, Cairo, is on the Nile where the delta begins. It is the largest city of Africa. Over 2,600,000 people live there. In what is called the foreign quarter of the city are the palace of the ex-King of Egypt, the government buildings, and the homes of the wealthy Egyptians. In this part of the city, you will find the modern hotels and shops.

Here, too, is a great museum, in which are stored ornaments, jewels, garments, and furniture of the early Egyptians. Still more wonderful is the museum that holds the bodies of their kings who ruled Egypt many hundreds of years ago. The Egyptians treated these bodies with spices and ointments to preserve them. They are called *mummies.*

Ibn was especially interested in the zoo. Here he saw many kinds of animals from all parts of the world.

The streets of the foreign quarter are wide and paved, and there are beautiful parks. One sees people from many lands —Orientals, or people from the Far East, in strange, colorful dress; Egyptians; Arabs; Europeans; Americans. Well-to-do Egyptians are richly dressed. Some of the women still wear veils over their faces when they appear in public.

In the native quarter, tiny shops line the narrow, twisting, unpaved streets. At the shop entrances sit the merchants, making the articles they sell. Perhaps they are making copper pots, and then what a noise their hammering makes!

There is great variety in merchandise —beaded and embroidered slippers and

Modern buildings stand side-by-side with ancient structures in Cairo, the largest city in Africa.

Brown Brothers

shoes, rugs, watches, jewelry, perfumes, spices, books, leather goods, and copper articles. The streets are thronged with people on foot or on donkeys. Sometimes one sees a horse or a camel.

About nine-tenths of the natives of Egypt are of the Mohammedan faith. This is the faith of Sheik Ilbrahim and the Arabs. They worship a god whom they call Allah. Their churches, or *mosques,* are large, beautiful buildings with rounded domes. From their roofs rise tall, slender towers, each having a small door and balcony at the top. These are the *minarets,* from which the Mohammedan priests call the people to prayer.

All these things Ibn learned and saw in his three short weeks in Egypt. Abdul took him about while Sheik Ilbrahim was meeting with Arab leaders. But on the long trip home across the desert, Ibn talked over what he had seen with his father. He felt much older and wiser. Had he not seen more than almost anyone in his oasis? Yet, as the days passed, he found himself more and more eager to reach the oasis. After all, it was home.

QUIZ QUESTIONS

1. Where is Egypt? Point in that direction.
2. In what climate belt does Egypt lie?
3. In what important way does Egypt differ from the Sahara?
4. Where does the Nile River rise? Into what does it empty?
5. In what direction does the Nile flow? The Amazon?
6. Tell about the tributaries of the Nile.
7. How was the delta of the Nile formed?
8. How does the Nile help the Egyptians who live along its banks?
9. Tell three means used by the Egyptions for many, many years to get water to moisten their land.
10. What great modern works have been built to protect against floods and to help irrigation?
11. How is the water carried to the fields?
12. How does Egypt show the importance of water to human life?
13. Tell briefly about the ancient ruins of Egypt.
14. Describe the houses of the Egyptian farmers.
15. What crops do the farmers raise?
16. How do the Egyptian peasants dress?
17. Are there many people in Egypt?
18. Describe the climate of Egypt.
19. What is the capital city of Egypt? Where is it located?
20. Name several of the sights of Cairo.

MAP EXERCISE

1. Locate Egypt on the globe.
2. Compare the location of Egypt with the locations of the Amazon Valley and the Sahara Desert.
3. Trace the course of the Nile River from its mouth to its source.
4. Locate Cairo on the globe.

CAN YOU DO THIS?

1. Draw a picture of Ibn and his father in Cairo.
2. Make a model of a pyramid.
3. Make a movie of Ibn's journey and his visit to Cairo.

Courtesy of Swiss National Tourist Office

Beautiful scenery makes the Lake of St. Moritz in Switzerland a favorite vacation spot.

Unit X

SWITZERLAND, A HIGH MOUNTAIN HOMELAND

You are now going to visit a land very different from the wet forests of the Amazon or the desert land of Africa. It is very unlike the grasslands where the giraffe roams.

Switzerland is in Europe. If you look at the globe and locate New York City, you will find that it is a little south of the 40° parallel of latitude. Switzerland, you will find, is located just north of this parallel. It is a small country, less than half the size of our state of Maine.

Switzerland is a mountainous country. These mountains have helped protect the Swiss people from any invaders who might seek to conquer them. They have been free to live and work as they thought best. Their homes, their food, and their ways of making a living show that they are mountain people.

A High Mountain Land. Your map of Europe will show you that Switzerland is a country without a seacoast. It is almost entirely enclosed by ranges of mountains, with other ranges crossing it. In the southern part of the country are the mighty Alps. In Switzerland, these mountains do not lie in long, orderly ranges, as they do in much of our own western land. Instead, a model might be

H. C. Maeder, from Swiss Tourist Office

Cheerful roadside signs line the highways.

made of them by dropping on the ground a giant handful of sharp, jagged rocks, and filling in spaces between with earth.

Mountains cover three fourths of Switzerland. Between the mountains are high plateaus where, in summer, the air is fairly warm. If you should climb a nearby mountain, you would find that as you get higher and higher the air grows cooler and cooler. Keep on, and you will come to a height where it is so cold that trees do not grow. This is called the timber line. Still higher there is only bare rock.

If you climb a very high mountain, you will find snow and ice at the top, and real winter weather. So we learn that the higher a country is above the level of the sea, the cooler it is likely to be. Height above sea level is called *altitude*. Switzerland has high altitude.

This high mountain country of Switzerland is a land of wonderful scenery. Tall, jagged, snow-capped mountain peaks glisten in the sunlight and are mirrored in lovely little lakes in the valleys. Splendid forests grow on the lower mountain slopes. Swift rivers of white, foaming, icy water go rushing through the deep gorges between the mountains. What a different land from the dry Sahara or the rain forest!

Avalanches. The mountains of Switzerland are very tall and steep. Some of their snow-covered peaks are more than two miles above the level of the sea.

In winter, when the snows are deep, great masses of snow sometimes start sliding down the mountainsides. Once started, they gain speed and move faster and faster. As they come tearing down, they cut away quantities of rock, earth, and trees from the mountain slopes. At rare intervals, whole villages are buried. In the valleys or in the narrow passes between the mountains, the snow comes to rest. When the snow melts, the stones and earth which were brought down the mountainside are left to tell the story of what happened. Wherever these *avalanches,* as they are called, come down, they leave deep scars in the mountainside.

Sometimes an avalanche occurs in summer when the snow near a mountain peak, warmed by the sun, softens and goes sliding down the mountain.

Glaciers. On some of the highest mountains, the cold is so great that the snow never melts away. With each storm

H. Armstrong Roberts

The Matterhorn is the most famous of Switzerland's mountains. Notice the flowers on the pasture in the foreground.

it piles deeper and deeper, until finally the snow at the bottom of these great drifts turns into ice many feet thick. When the weight of the ice becomes very great, it begins to creep down the mountainside. These slow-moving ice rivers are called *glaciers*.

As a glacier moves downward, it scrapes loose dirt, small rocks, and stones in its path. These are pushed along by the ice. Much of the material is ground into fine sand and soil on the solid rock over which the glacier passes.

At last the glacier reaches the lower slopes, where the air is warmer. The ice gradually melts and forms little, rapid streams which flow into the lakes below. The largest stones stay where the glacier melts, but the smaller ones are carried along by the streams.

The Roof of Europe. Some people call the Alps the "roof of Europe." Why would anyone say that? It might be because the Alps have the highest altitude in Europe, just as a roof is the highest part of a house.

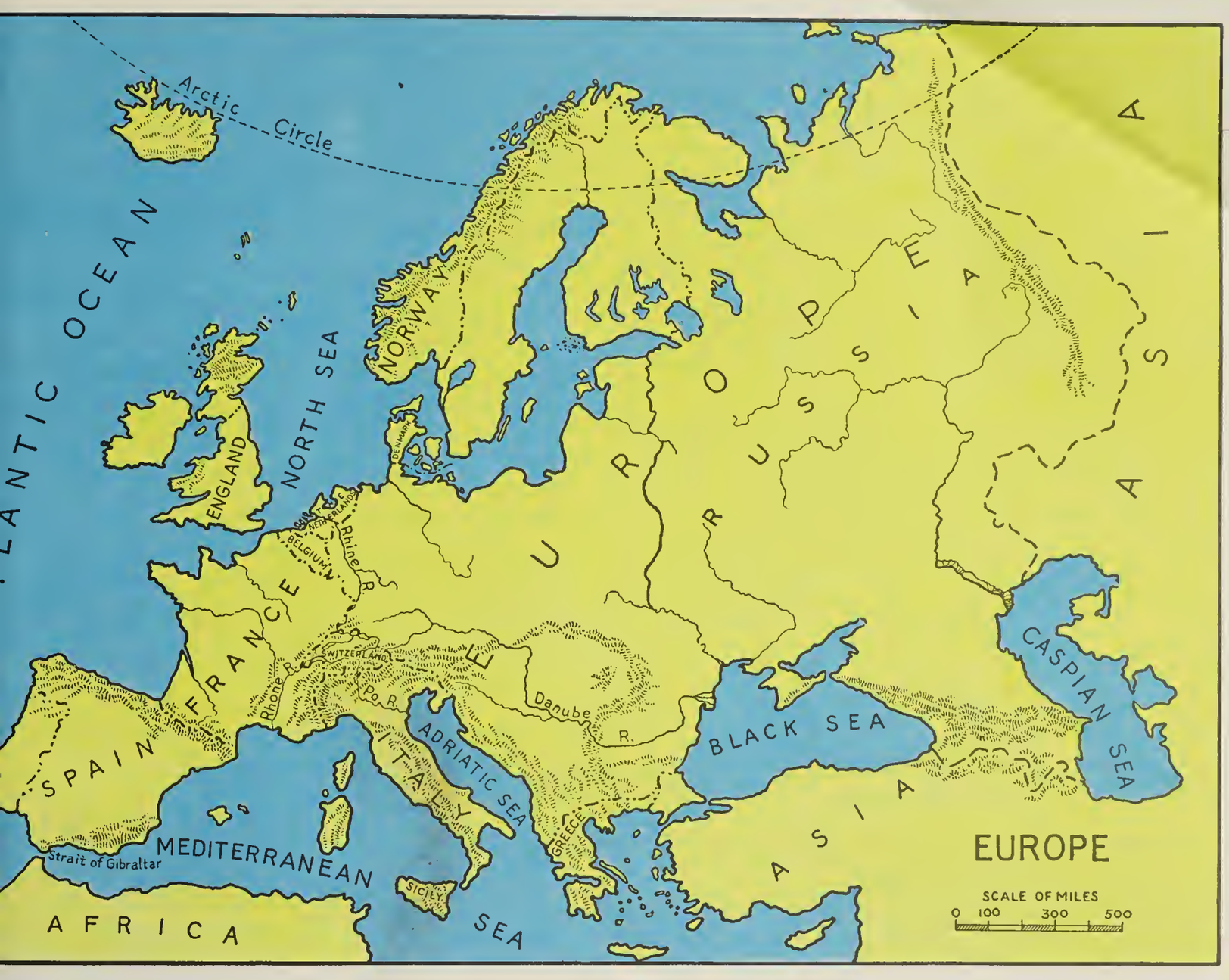
The highest part of a slant roof is the ridgepole, where the two sloping parts meet. Some of the rain which falls on the roof flows down one slope. The rest of the water flows down the other slope in an opposite direction. High mountain ridges are like slant roofs. Water flows down their sides in different directions.

Where Four Large Rivers Start. Four large rivers of Europe, the Rhine, the Rhone, the Danube, and the Po, have their beginnings in the area of the Alps. Each of these four rivers flows in a different direction and into a different sea. The Rhine flows north across Europe and empties into the North Sea. The Rhone flows southwest into the Mediterranean Sea. The Danube, beginning in the German Alps, follows a twisting course eastward to the Black Sea. The Po flows southeast into the Adriatic Sea. How different is the Amazon Basin, where all the water drains into one great river that flows into the Atlantic!

An Important Little Country. Switzerland, though small, is a very important country. Her people have made the most of what nature has given her. The amount of land which can be used for farming is small, but all of it is worked. Hay is grown on the mountain slopes where it is impossible to raise other crops.

The Rhone flows from this glacier southwest into the Mediterranean Sea.

Swiss National Tourist Office



As is usual in mountain regions, there are many waterfalls and fast-flowing mountain streams. The Swiss make this waterpower turn wheels which produce electricity. This electricity runs machinery in factories, and supplies cities and towns with electric light.

How People Live in the Cities and Towns. It is too cold on the mountains, and the slopes are too steep and rough, for many people to dwell there. So most of the Swiss live in the valleys or on the plateau land. Here are attractive little cities and towns with modern buildings much like our own. The best known of the Swiss cities are Bern, the capital, and Geneva, Basel, and Zurich, which are manufacturing and business centers.

The people of the cities live and dress much as we do. In the mountains many of the natives still wear the quaint dress of earlier times, especially on holidays.

Where the houses have more than one story, the walls of the first story are usually of stone. The upper part, including the overhanging roof, is of wood. Flower-trimmed balconies give many of the houses a bright and cheerful look. Sometimes parts of the woodwork are beautifully carved and are painted in gay colors.

The Swiss people are hard-working and are very skillful in the things they do. Dairying is one of their chief industries. Grass grows thick in the high mountain valleys. It is good food for

cows. In summer, boys and young men drive the cows to these high pastures.

The farmer must use this milk quickly or it will spoil. Some milk is churned into butter. Some milk is taken to the chocolate factories. Here it is mixed with cacao, or raw chocolate, from Africa, and with sugar to make delicious milk chocolate.

The mountain farmers raise goats as well as cows. Some of the milk of both of these animals is made into cheese.

In the winter, the village people carve wooden toys, clocks, and ornaments. The women make beautiful embroideries and handkerchiefs.

Though a great deal of work is done by hand, much is also done by machinery in busy factories. At Zurich and Bern there are cotton, silk, and woolen mills. Basel is noted for its ribbon manufactures. The materials from which these products are made are brought from America and other countries.

The greatest industry of all is watch and clock making. Swiss jewelers are said to be the best in the world, and Swiss watches are considered as fine as money can buy. Geneva is the center of the watch and jewelry trade. A newer industry is the making of fine fishing reels and cameras.

Swiss Trade. But while Switzerland has many manufacturers, she has no seacoast, no harbors, and no great ships to carry her goods to distant lands. For this reason, the Swiss are not counted among the great trading nations of the world. Even so, for its size, Switzerland does an immense business with other nations. In America, for example, some of us wear Swiss watches, ribbons, jewelry, and laces, and use Swiss embroidered handkerchiefs and other articles. Possibly we have eaten Swiss chocolate and Swiss cheese. These goods are shipped out of Switzerland by river boats, by railroad, or over the country's splendid roads. Many of these highways have been carved out of the mountainsides. Where it was difficult to build railroads over

The greatest industry of Switzerland is watch and clock making. Swiss jewelers are said to be the world's best.

Keystone View Company

the mountains, tunnels have been blasted through the solid rock. One of these tunnels is twelve miles long. Electricity is used to run the trains through the tunnels. The Swiss have no coalfields, but it is easy to use the waterpower of their streams to make electricity.

PHIL VISITS A MOUNTAIN VILLAGE

It was one of the mountain trains that landed Phil Taylor and his father in Bern one afternoon in early summer. Mr. Taylor is an American importer. That is, he is a businessman who buys goods in foreign lands, and sells them to dealers at home. Now he had come to Switzerland to buy Swiss goods. He had brought Phil along for a vacation trip.

That afternoon they went first to the Bear's Den to see the brown bears. The name of the city, Bern, means "bear." It was chosen, according to an old legend, because many bears were killed on the land where the city was founded. Now the city is proud of its bears. Not only does it have live ones. Bears are carved in wood and stone on buildings throughout the city, and toy bears are common. When the clock strikes on one old clock tower, a troop of wooden bears comes out and parades before the clock's face.

On the way back to the hotel, Phil and his father explored this old city. They visited the parks and saw the splendid bridges over a stream. They viewed the towering snow-capped peaks in the dis-

Many splendid old buildings still remain in Bern, Switzerland's capital.

Swiss National Tourist Office

tance. The mountains sparkled in the late sun. Then the two visitors passed fine, modern buildings and came to a section of the old city. Here were narrow, crooked streets, lined with little shops in ancient wooden buildings. Many of them were beautifully carved. But some leaned over at different angles, as if they had become very, very tired from standing so many years. However, the little shops were well lighted by electricity, and they were filled with the beautiful goods the Swiss know so well how to make.

Brown Brothe

Numerous clocks ring on the hour in Bern.

At dinner, that night, Mr. Taylor said, "From tomorrow on, I won't be able to show you about. I must spend my time at the Swiss mills. So I think I will take you up to the home of my friend Mueller. He is a mountain guide. Years ago, he helped me climb the Matterhorn, a famous peak. Staying with him, you will be able to see the mountain and village life. I'll come up later to get you. How about it?"

"That will be fine, Dad," exclaimed Phil, "so long as I can't be with you."

"We will start tomorrow," said his father.

Mr. Taylor had rented a car for use during his business trip. In the morning, the two started on their way. At first, the fine highway ran across the plateau, giving magnificent views of the snow-capped peaks. It was odd to look across fields thick with blooming flowers to the wintry views above. It was like two seasons in one, Phil said.

Then they began to enter the lower mountain slopes. The highway climbed, twisted, and turned. They shot through little valleys between towering peaks. Everywhere were waterfalls, rushing streams, and tiny lakes. Phil found,

Pan American World Airways

During what season must this picture have been taken? Why?

when he tested it, that the water was icy cold.

Then more peaks appeared. Phil caught his first close glimpse of a glacier between two of them. Now the road climbed steeply. It was blasted out from the cliff wall. They could look straight down a thousand feet to the white water of a rushing stream.

At noon, they stopped at a mountain inn for lunch. The waiters wore heavily embroidered short jackets. The maids wore their village costumes, with colorful skirts and blouses. The guests were speaking in different languages, for they come to Switzerland from many lands. However, the waiters could speak English.

After lunch, they drove deeper into the mountains. At last, they came to a long, narrow valley lined with small houses. The first story of each was of stone. Above, was a high peaked roof overhanging at each end and with windows under the peak. The wooden fronts of a few houses were carved. The houses were painted different colors. They made Phil think of a toy village.

They stopped before a house painted blue. A tall, slender man came out and greeted Mr. Taylor warmly. This was Mr. Mueller. He said he would be glad to have Phil visit them. He might even take him up to the mountain pastures when they drove their cattle up for the summer.

Mr. Mueller took them into a large living room where a fire burned in the stone chimney place. There were others busy in the room. In one corner Mrs.

Mueller was wrapping cheese. In the chimney corner, her mother was making a lace collar. In another corner, a younger brother was carving the figure of a man on skis.

"This is Greta," said Mr. Mueller, as a young, flaxen-haired girl came forward. "She will show you about, Phil, while I talk to your father."

Greta smiled a welcome. She took Phil up to a room under the roof. "You will sleep here with my brother Hans," she said. "He is out tending the goats, but will be back soon. Now let's look around a bit." When Phil asked, she said she had studied English at school.

"Say something in Swiss," said Phil.

Greta giggled. "There is no Swiss language. In part of our country, the people commonly speak French; in another part, German; and elsewhere, Italian. But we are all Swiss, just the same," she said proudly.

She led the way downstairs, and opened a rear door. To his surprise, Phil found himself in a dairy. A row of cattle in stalls were munching hay. Everything was neat and clean. Beyond were sheds where hay and firewood were stored. In a basement, more hay was stored and there were bins for vegetables.

"You see," said Greta, "when the great winter snows come, we do not need to go outdoors. Everything is under one roof."

"By the way," said Phil, "why are the roofs of your houses so steep?"

"Snow, again," said Greta. "They are steep so that the masses of snow will slide off. Otherwise their weight would crush the roofs in."

"How do you get about in winter?"

"Snowshoes and skis, and sleds when the roads are open," said Greta.

They went out and walked down the village street. Greta pointed out the little school and the village church. They crossed a bridge over a roaring stream. "The stream gives us electricity for light," Greta said, "and we pipe water from it for our houses."

A side path led down to a fairly level stretch of well-sheltered land. Here wheat, potatoes, cabbage, oats, and barley were growing. Greta said they had orchards on mountain slopes lower down; and beside a lake, where the air was warmer, they had vineyards.

"It must be lonely around here in winter," said Phil, as they climbed back to the road.

"No," said Greta. "We have visitors who come for winter sports—tobogganing, skiing, and skating. Down where the lakes are large, there is ice-boating. Dad says he thinks taking care of the thousands of tounrists who come from all over the world is our country's biggest business. They come to breathe the healthful mountain air, for sight-seeing and mountain climbing in summer and fall, and for the winter sports.

"You noticed the tourist hotels on the plateau, and on the mountain slopes and even on the tops of low mountains. It takes a lot of our people to run these places, to provide food, to act as mountain guides, and direct other sports. But the tourists pay well for this work."

As they turned down the village street, Greta said, "Listen!" Phil heard bells tinkling.

"The village goats are coming back," said Greta.

At the far end of the village street, a large flock of goats appeared. Two or three leaders wore bells. A boy walked

The stream rushed through the little valley.

in front and other boys were behind the flock. The flock grew smaller as goats turned off at one house or another. Finally, Hans came along with the Muellers' goats. He was a stocky, friendly chap and he and Phil hit it off at once.

At supper, Mr. Mueller said, "On Thursday, we take the cows to the summer pasture. Phil will go with us. And you, Hans, may go this year."

Hans grinned at his father. "Thanks, Dad. At last I've outgrown the goat-tending."

"You haven't grown up yet, Hans," his father reminded, smiling.

Hans roused Phil very early Thursday morning. "I hope your legs are good for climbing," he laughed.

"I guess I can climb where your cows can," said Phil.

"You don't know our cows," chuckled Hans.

After breakfast, Hans and his father led out the cows. The two leaders had large bells strung around their necks. Behind the cows Mr. Mueller's two brothers fell in line. They were in native dress, as if for a special occasion. On their backs they carried long woven baskets in which were packed provisions and tools.

With a clanging of bells, they started down the village street. As they passed other houses, more cows and men fell in behind. Women and children stood in the doorways, waving and calling good-by. Some of the young men, they knew, would be away all summer. By the time Hans and Phil reached the far end of the village, there was quite a procession be-

hind them. The air was filled with the strange music of the jangling bells. Some young fellow yodeled or sang, his voice echoing back from the cliffs. Other men down the line replied to him.

Presently the procession turned off the highway into a woods road. In a short time, this turned into a narrow, steep path. Now animals and men went single file. Phil was thankful that they stopped frequently for rest. He was not used to this high mountain air. The cows had been out little since the last fall, so they, too, were willing enough to stop.

Gradually the trees became fewer and shorter. They were getting to the timber line. Phil found himself very hungry when they stopped for lunch. The cows ate the tender new leaves of bushes, but were kept away from large patches of grass that now appeared. "We save some grass for hay," Hans said.

The afternoon march was very hard for Phil. His legs ached. He found it hard to breathe. Yet the air was bracing. Soon the trees were all gone and patches of grass and areas of bare stone appeared. Finally, in a level pasture, they came upon several small stone huts. They had flat roofs.

"Why?" asked Phil. "In your village, your houses have pointed roofs."

In winter a deep snow blanket lies over the village.

H. Armstrong Roberts

Courtesy of Swiss National Tourist Office

Cattle are taken to high pastures in the Alps to graze.

Hans grinned. "We use our heads. In our village, we are protected from high winds, so the snow would pile up on the roofs. Up here, the winter winds are fierce enough to blow your hair off. They keep these flat roofs clean. You see, we even have to put big stones on the roofs to hold them down.

Quickly the men got settled in the huts. The cattle were eagerly feeding on the fresh, green grass. Hans said they would stay here until the grass was eaten down. Then they would go to a higher pasture. In this manner, they would climb slowly all summer, as the snow melted ahead of them. In the fall, they would move slowly back.

Mr. Mueller had started back as soon as they arrived. He had to guide a party of mountain climbers the next morning. Before he left, he pointed out to Hans a long, snowy ridge on a nearby peak. "Look for me on that slope about eleven o'clock tomorrow," he said.

Phil found that first night was a strange one. Even when well wrapped in blankets, he was cold. Through the open window, he could see the stars shining more brilliantly than he had ever seen them. All around him was a great silence, broken only by the low murmur of cattle, by the sharp report of cracking ice, or by the sound of the wind.

In the morning, everyone settled down to work. Some watched the cows, to see that they did not wander off to seek new pastures before they had eaten off the grass on their own. Some milked the cattle. Later they would make butter and cheese, and "pack" these products

back to the village. Still others went down the mountain seeking grass tall enough to cut for hay.

Hans and Phil helped with the cattle until about eleven o'clock. Then Hans borrowed a field glass, and the two boys moved off to a point where they could see the snowy ridge, or shoulder, Mr. Mueller was to climb. Hans took a long look, then handed the glass to Phil.

"I don't like it," he said soberly. "See how the snow overhangs in a big lip. It may let go as the sun softens it. It's dangerous. I saw Dad studying it yesterday."

Mountain climbing is a dangerous sport.

Black Star

They waited. Suddenly Hans pointed. At the lower end of the sharp shoulder, four dark specks appeared, spaced some distance apart. Hans said his father was in the lead, and the men were roped together.

The dark dots seemed to creep along the slope that Hans said was as sharp and dangerous on one side as on the other. At last, the figures reached the overhang. Hans stood with his eyes glued to the glasses. His face was white.

Suddenly the boy gasped. The second tiny figure seemed out of line towards the drop. The other figures shifted away from it. Suddenly a section of the lip slipped away, showing bare rock. A mass of snow dropped to the slope far below. There it started other snow masses. Snow powder shut out the view. The dull roar of the avalanche filled the air.

Hans stared at the shoulder. Phil found himself holding his breath. Then the snow dust cleared. There were the four dots further in from the edge.

"They saved him," gasped Hans. "The snow gave way under the second man, but the rope held. It will be better coming down."

"Why?" asked Phil.

"That snow was in the sun all the morning and was soft. Soon the shadow of peaks will fall on the slope. It will be colder, and the wet snow will freeze."

"That's dangerous work for your father," said Phil.

"Yes," replied Hans. Then he added proudly, "He's never lost a man he has guided."

As the days passed, and one pasture was eaten down, men and cattle went up to the next higher, following the retreating snow. Once the two boys tramped on up to the edge of the snow field. Phil saw bright flowers growing at the edge of the snow.

In the huts, the men made butter and cheese. Every few days, one of the men took a great pack of these products down to the village. Late in the day, he would come back with provisions, mail, and messages from home. At night, around a fire, the men sometimes sang. They often told folk tales of the country, and made Phil tell about his own homeland.

One day, Hans took Phil down to where the men were cutting hay. They cut it with scythes on slopes too steep for pasture. The scythes are long knives fastened to oddly bent handles. The men cut the hay from the top of the slope downward. After it was dry, they tied it in large bundles. These they rolled or dragged to the nearest trail. Even the hay had to be carried to the village on men's backs.

All too soon, Phil had to start back to the village with one of the men. Hans stayed at the camp. He was a little afraid his father might not let him come up again if he went home. Phil was sorry to say good-by. He liked Hans and the men. They had accepted him as one of themselves. When he left, Hans' uncle gave him a little carved figure of Hans he had made one evening.

Back in the village, his father was waiting. There were good-bys to be said to Greta and her mother and father. Then they were off down the highway. But, until they were out of the valley, Phil kept looking back and up the mountain slopes he knew so much better now.

A Courageous and Liberty-Loving People. As they drove along, his father told Phil something about the brave little nation of Switzerland. He said that their busy, independent life in the mountains has made the Swiss a strong, courageous, and liberty-loving people. Hundreds of years ago, the Swiss farmers banded together and drove out an army of Austrian knights, who were trying to conquer the country. Since that time, no one has tried to conquer the brave Swiss. All men in Switzerland are trained to use weapons to defend their country, and they are ready to fight if anyone tries to invade their land.

Though they are brave and are willing to fight for their liberty, the Swiss people are also lovers of peace. During World War I and World War II, the nations on all sides of Switzerland were at war, but the Swiss managed to remain at peace. It was because of their peace-loving nature that their city of Geneva was made the headquarters of the League of Nations. This was a body of people representing many of the leading nations of the world. It did a great deal to keep the world at peace for many years after World War I, but it was unable to prevent World War II. The work of the League of Nations is now being carried on by another body known as the United Nations.

Other world organizations have chosen Switzerland as their headquarters. One is the International Red Cross. The American Red Cross is part of this international organization. As a tribute to a peace-loving people, the International Red Cross chose the same flag as their emblem by using the same design and reversing the color. The Swiss flag has a white cross on a red ground. What colors does the Red Cross flag have for cross and background?

When you see the Red Cross flag, think of the good work that organization does all over the world. Think, too, of the freedom-loving Swiss people living bravely among the mountains.

QUIZ QUESTIONS

1. Locate Switzerland on a globe or map. Is it on any sea?
2. How does distance from the Equator affect the climate of a country?
3. How is the climate of a country affected by its height above the level of the sea? Tell how Switzerland shows this to be true.
4. What is an avalanche? What damage does it do?
5. What is a glacier? How is it formed?
6. What becomes of glaciers when they reach the lower valleys?
7. Name four rivers that have their beginnings in the Alps. Tell the direction in which each flows and the sea into which it empties.
8. Where are most of the cities and towns of Switzerland located?
9. Name three of the best-known cities of Switzerland. What is the capital?
10. Tell about the houses of the Swiss people.
11. Name several occupations of the people of the Swiss cities.
12. Do the Swiss send their goods across the sea in their own ships? Why?
13. Tell about the Swiss highways and railroads.
14. Describe a farmhouse in the Swiss mountains.
15. Tell about the farm village.
16. What crops do the Swiss farmers raise? What other products help support them?
17. Why do many people of other countries visit Switzerland?
18. Name some of the winter sports.
19. Why are the mountains of Switzerland a source of wealth to her people?
20. Name several fine qualities of the Swiss people.

CAN YOU TELL?

1. Can you tell in three sentences about a glacier?
2. Can you tell in three sentences about a Swiss home?
3. Can you tell in six sentences about Switzerland?
4. Can you tell in three sentences about how the Swiss people make their living?
5. Can you tell in three sentences about something you have which came from Switzerland?
6. Can you tell in three sentences about the highways and railroads in Switzerland?
7. Can you tell in three sentences about a Swiss mountain village?
8. Can you tell in three sentences about summer life in the Swiss mountains?

Ewing Galloway, N. Y.

To protect the irrigated land from floods, the Dutch built a great network of canals.

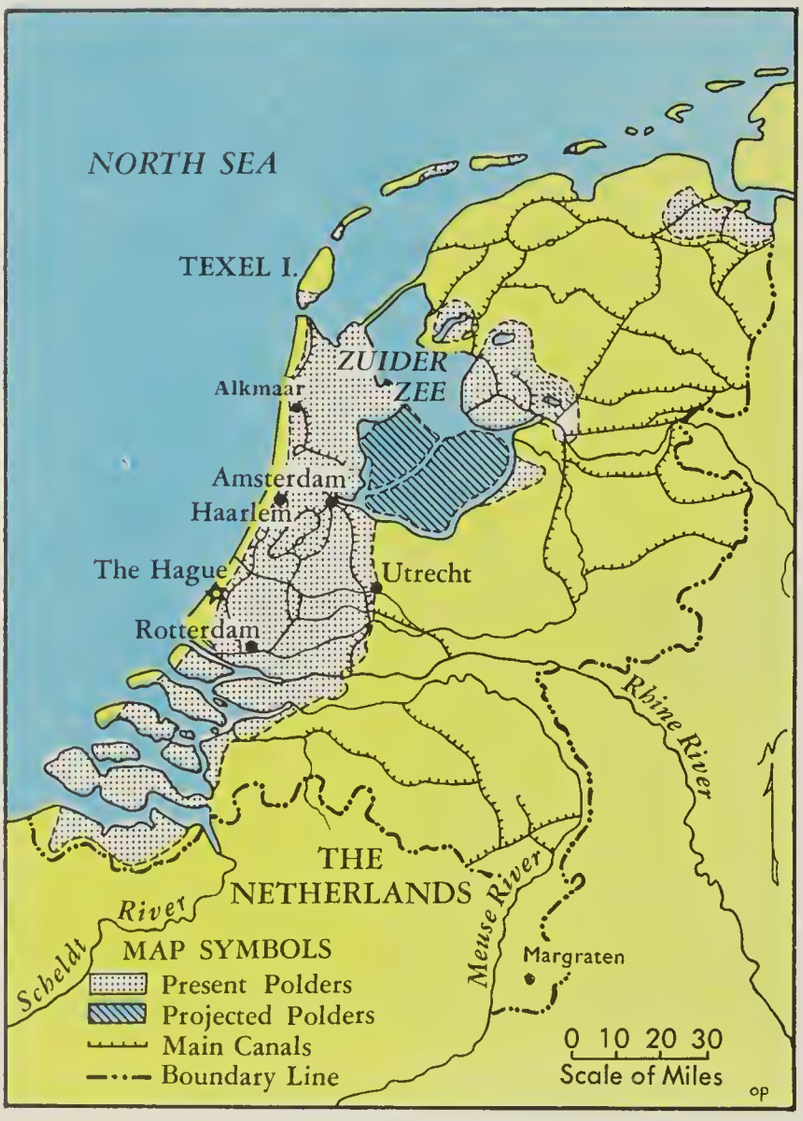
Unit XI

THE NETHERLANDS — A LOWLAND COUNTRY BESIDE THE SEA

You remember that the Rhine River is one of the large rivers that rise in the high mountains of Switzerland. It flows northward across Europe to the North Sea. There you will find a great delta, somewhat like that of the Nile River. The land in the Rhine Delta is rich lowland, formed by the earth which has been brought down from the mountains by the river. Through this land, run the river's many outlets to the sea.

The Netherlands. The delta of the Rhine is part of the lowland country of the Netherlands, or Holland. Both names mean "lowland." The Netherlands is the home of the Dutch, a loyal, courageous, and thrifty people. The country is farther north from the Equator than Switzerland. Yet it is not so cold. This is partly due to winds which blow over a warm ocean current and bring warmth to the land. It is also due to the fact that the Netherlands is a low country, and Switzerland is a high country. What effect does height have on the temperature of a country?

Taking Land from the Sea. Strangely enough, about one fourth of the Netherlands is below sea level, yet the sea does not flow over it. How can this be possible?



A map of the Netherlands

Centuries ago, this part of the Netherlands was all under water. However, the sea water which covered it was shallow. So the thrifty Dutchmen, needing more farm land, decided they could push the sea back and make use of the land it had covered. Little by little, they built high, thick walls of earth and stone, called *dikes,* around sections of this shallow coast. Then they pumped the water out into the sea and dug ditches to drain the land. Water flowing through these ditches gathered in pools near the dikes and was pumped out into the sea.

You see, the Dutch have actually taken this land away from the sea. A section of land taken from the sea in this way is known as a *polder*. On the polders, the people build their homes and gardens, raise crops, and pasture cattle. Polder soil is moist and fertile and, so, is well suited to crops. Drainage ditches, dug across the fields, keep them from being too moist.

Dikes serve to keep the sea from flowing back over both the polders and the coastal lowlands. From time to time, in earlier days, the dikes would give way, and the sea would break through, flooding the land, sweeping away the houses and crops, and drowning hundreds of people.

Today, these sea walls are made much stronger than they were at first. They are built of stone, timber, dirt, and concrete. Every possible care is taken to build them strong and to keep them in good condition. As a result, the Dutch along the coast have little fear, even when winter storms rage on the North Sea and send great billows crashing against the walls.

In some places the people are helped by natural dikes, or sand dunes, which the sea has piled up along the coast. The Dutch build dikes connecting one dune with another, thus shutting out the sea.

In spite of all their work, the Dutch have a country only a little more than one fourth as large as New York State. As their population grows, they will need all the land they can get to raise crops for food. They have already drained about one half of an immense bay known as the Zuider Zee. More will be drained after the polders flooded in World War II have been pumped dry again.

The people of the Netherlands have more to do to protect their homes and lands than simply to keep the dikes from breaking. The moist winds from the ocean bring such heavy rains that the

Ewing Galloway

Holland's dikes must be strong and wide to resist the sea.

polders would soon be flooded if there were no way to get rid of the rain water.

To meet this danger, the people have built a network of canals throughout the country. Many of these canals are higher than the fields through which they flow, and are walled in by dikes. The water which drains from the fields into the ditches is pumped into the canals, which carry it into the Rhine or to the sea.

Putting the Wind to Work. In the old days, the Dutch pumps were driven entirely by windmills. Now, more and more, gasoline and steam engines are being used for this purpose. One may still see many windmills along the canals. They not only pump water, but also grind grain, and even make electricity. The land is so flat that the rivers flow very slowly. There are no waterfalls or swift streams which can be used to drive waterwheels, like those in the mountain country of Switzerland. Wind power and gasoline and steam engines take the place of water power. Winds are frequent and steady, so they can be depended upon. For centuries, the Dutch have made the wind do many kinds of work for them.

Water Highways. The canals of the Netherlands have other uses than draining the land. In many sections of the country, they take the place of highways and roads, and in the cities they sometimes even take the place of streets. You see the people in boats going from place to place or carrying their crops and other products to the markets. In winter, when

Caterpillar Tractor Co.

On the polders, the people build their homes and gardens, raise crops, and pasture cattle.

the canals are frozen, it is a pretty sight to see the Dutch traveling over the ice in sleighs or skating to their work, to school, or to church.

Farm Lands. On the polders of the Netherlands and on other farm lands, most of the farms are very small. There are so many people in this country that each farm family owns but little land. However, the soil is rich and the farmers cultivate every foot of it. The farmers raise wheat, barley, oats, potatoes, sugar beets, and other vegetables, such as are grown in our own country.

The Dutch are very fond of flowers, and the raising of bulbs has become one of their chief industries. They grow whole fields of flowers, especially tulips and hyacinths. The bulbs, from which new plants will grow, are shipped to other countries. Their sale brings the Dutch people much money.

In spite of the drainage ditches, some fields are not dry enough to plow for crops. On these, grass is grown, and many cows are pastured. Dairying is an important industry in the Netherlands. The cows are of fine breeds and are well cared for. Some of the milk is used for food. The rest is made into fine butter, cheese, and chocolate, for which the country is noted. These products are shipped to other countries.

Dutch Cities. A far larger part of the people of the Netherlands live in cities and towns than is the case in any other country we have studied. This little country is so small that, even when every

Brown Brothers

In the winter, the waterways of the Netherlands freeze and can be used for skating and ice boating.

foot of farm land is used for crops or pasture, there is not enough farm work to keep any great number of people busy. Because there is not work enough on the farms, many of the young people go to the cities and towns to work.

Most of the Dutch cities are full of interest for the visitor. Some of the large buildings look like buildings in our own cities. Others are of Dutch designs that are very different. There are also fine old buildings that have stood for hundreds of years. The Dutch have always had great painters, and their art museums are among the best. The stores are many and good.

Many of the Dutch houses are of brick. Holland has neither forests nor stone quarries. So it makes the most of its beds of clay, making brick for walls, and tiles for the tall, steep roofs. Little dormer windows are built out from the sides of the roofs. All the brick and tile are kept clean and bright.

If you went through the busy streets, two things would surprise you. One would be the number of bridges. Holland might be called a country of bridges. The beautiful old city of Dortrecht has within its boundaries four rivers and many connecting canals. You can imagine how many bridges are needed here. The second feature is the number of bicycles. Bicycles are as common in Dutch cities and rural areas as are automobiles in our land.

Harbors and Seaports. Some of the seacoast cities have fine harbors. The ocean runs far into the land, forming bays and channels. These are well protected

from ocean storms by the land about them. The bays make safe places for ships to anchor. Because of their good harbors, and because of the trade on the rivers and canals, the Dutch seaports have become important cities. Amsterdam and Rotterdam are among the largest. Ships from all over the world come to their great docks to unload supplies for many of the countries of Europe. These supplies are then loaded onto river steamers, canal boats, and trains, to be carried to inland cities. Then these great ocean ships take on other goods, which the Dutch and other peoples of central Europe wish to send to distant countries, and off they sail across the ocean.

The Dutch as Traders. Because their country is so near the sea, the Dutch people have always been sailors and traders. Long ago, their vessels explored the oceans. In the early days, they discovered and claimed certain lands which have brought them great wealth. Most of the islands of the East Indies, lying between southeastern Asia and Australia, once belonged to the Dutch. Their people still have close trade with the Dutch. From them, the Dutch get coffee, tea, rice, sugar, tobacco, rubber, and spices.

The Dutch ships, as well as those of most every other country in the world, carry Dutch products to distant lands. Many Dutch ships carry on trade with our United States, bringing cheeses and

Dutchmen travel on water avenues in the large city of Amsterdam.

Screen Traveler, from Gendreau

Ewing Galloway, N. Y.

Dutch harbors are crowded with boats from many countries.

flower bulbs and carrying home loads of grain and cotton. From Africa, which the Dutch also helped to settle, they take back diamonds and ivory.

Dutch Industries. One of the great industries of the Dutch is diamond cutting. When diamonds first come from the mines in Africa, they look like rough, dirty pebbles. The skilled Dutch workmen cut them, polish them, and change them into beautiful gems. The city of Amsterdam is a center of the world's diamond trade.

The manufacture of iron and steel machinery, and the making of fine china, are other leading occupations of the Dutch. The city of Delft is famous for its chinaware. Perhaps you have seen some blue or brown Delft china showing Dutch scenes.

JANSJE MAKES A FRIEND

Jansje lives in a small Netherlands village. It was here that she met Kathie.

Jansje was speeding along the canal path on her bicycle. Now and then, she called greetings to other children. Just beyond the village, she waved to the old captain of a bright blue barge that chugged slowly by. Along each rail of the boat, colorful flowers bloomed in a boxed-in garden. Jansje half turned to look at them and so failed to notice, until almost too late, the girl bicycling toward her on the narrow path. Jansje swung off instantly, but her bicycle clipped the wheel of the other girl. The girl fell off, and the bicycle fell on top of her.

Standard Oil Company (New Jersey)

Holland's farmers must raise a large amount of hay to keep the dairy cattle well fed throughout the winter.

"I am so sorry," Jansje said, as she helped the stranger up. "Are you all right?" she asked.

"Yes," was the reply.

"I should have been watching. You are one of our friends, the Americans? I am Jansje." Jansje's quick eyes had noticed the dress, so different from her own, and the little knot of red, white, and blue ribbon in her brown hair.

"Yes, I am an American. My name is Kathie," the other girl smiled. "Is it far to the edge of the polders?"

"It is yet some distance," replied Jansje. "Where are you staying?"

"My mother and I are staying in the home of Mrs. Hals, in the town back here."

"And I was going to Vrow Hals on an errand. Perhaps your mother will let you visit me for the day. Then my brother will take us out when he goes to our polder farm."

Kathie's mother liked the fair-haired, blue-eyed Jansje, and Mrs. Hals put in a good word. So the two girls were soon on the way, the Dutch girl leading.

"I just love your lace cap and embroidered dress. It is the prettiest design I've seen," said Kathie. "I was disappointed to see so few national costumes in the cities."

"It is in the small towns and villages that we wear them most, and only on special days. This is one. Each town has its own design. A person's costume tells me where he lives."

Kathie exclaimed in delight when they rode into the village. On each side of the canal was a row of cottages with steep

Standard Oil Company (New Jersey)

These homes are built along a water avenue, just as our homes are built along land avenues.

red or yellow tiled roofs and tall chimneys. The walls were painted blue or rose or lavender. Low hedges separated the grounds. Within were beautifully kept lawns or grass-bordered gardens in perfect condition. Everywhere were blooming flowers.

"It's perfect," said Kathie. "Everything is so clean and fresh. Why, even the houses look as if they have been painted or scrubbed every day. How do you do it?"

"We just work at it," laughed Jansje. "We love to have things clean."

They stopped half-way through the village, and Jansje led the way across a footbridge over the canal. "We're home," she said.

The house was a delicate blue with a warm-red roof. The window shutters were golden yellow, with a tulip design cut through the solid wood. A red-tile walk led to the brick doorstep. Both had been scrubbed until they shone. A little side path was made of carefully brushed white sand.

As they started up the walk, a sharp squawk made Kathie jump and glance upward. Staring down at her from a rough nest of sticks at the top of the chimney was a large, long-legged, white bird, with black wing feathers. Suddenly, it flapped its wings and flew off, its legs held straight out behind it.

"A stork!" cried Kathie. "I never saw one so close before."

Robert N. Craven

The rich soil of the Netherlands yields valuable crops of flowers and bulbs for export to many nations.

"This pair has nested over our chimney longer than I can remember," said Jansje. She took off her wooden shoes and put them neatly on the doorstep. Then, as Kathie started to take off her own shoes, Jansje exclaimed, "Wait!" and dashed into the house. She came back with a pair of heavy knit socks. "Put these on," she said.

They stepped into a living-dining room which had a scrubbed wood floor. It was partly covered with a woven straw rug. Bright draperies covered the windows. On the walls were several paintings. One was of the Queen of the Netherlands, and the others were Dutch scenes. Around the wall above the pictures was a plate rail containing blue Delft ware.

The furniture was heavy, but finely carved. It looked as if it had been used many years. A great settee faced the large fireplace, where polished kettles hung. Dutch ovens were built into the brickwork of the chimney. Through a doorway, Kathie could see a small kitchen with a tiled floor.

Jansje's mother gave the dark-haired American girl a warm welcome. Then the two girls went up to Jansje's room under the roof, with its dormer windows and its view to the not-distant sea. Jansje said that their firewood was driftwood picked up along the shore. It burned with strangely colored flames, because of the salt and metal in it.

They were soon called to dinner. Jansje's father and her brother, Klaas,

had come in. Both wore baggy trousers into which their heavy shirts were tucked. Around their waists were wide leather belts, ornamented with metal. Outdoors, they wore round caps.

The meal consisted of fresh fish, caught by Jansje's father that morning, potatoes, Dutch cheese, fresh-baked bread, and rich milk. For dessert, there was some thick spice cake.

The family asked Kathie many questions about her homeland, for all could speak English. Kathie had her questions to ask, too. She had seen many ruined buildings left by World War II. She asked about them. Jansje's father said that the country had suffered terribly. Some cities had been partly destroyed, but rebuilding was already well along. Some of the worst damage had been done to the polders. Dikes and canal walls had been blown out, and sea water had flooded in. It took a long time to repair the dikes, pump out the water, and get the salt out of the soil. "But we will get even more land back in the future," he ended.

After dinner, Jansje got a pair of wooden shoes for Kathie, saying, "You will need these on the polders. The soil is very damp." They had a good laugh at Kathie's efforts to walk naturally in the heavy footwear.

Then they walked down to the canal with Klaas. Here, boats were tied up much like horses tied to a hitching rack. Klaas had an outboard motor on his rowboat, and they were soon chugging along the quiet waterway. After a mile or so, the right wall of the canal grew much heavier. Presently they looked off at the ocean and watched the surf roll in on the beach below them. The sea was dotted with steamers and fishing craft.

Suddenly, Jansje touched Kathie's arm and pointed left. The land had fallen far below them and was absolutely flat. Ditches separated it into fields, and each field was a solid block of color. There were red blocks and yellow and lavender —just masses of tulip blooms. In one spot, men were cutting the blooms and tossing them in piles.

"What a pity," cried Kathie.

"They want all the strength of the plants to go into the bulbs," explained Klaas. "We ship the bulbs all over the world. The rotted blossoms and stems will make good fertilizer. There is something in the polder soil closest to the shore that produces the best bulbs."

Farther on, they tied up at the bank and landed. Klaas led the way down steep steps to the polder. Here, vegetables and grain were growing. The children stopped at a windmill, passing under the revolving sails to enter a small door. Here they looked at the pump that was lifting the ditch water to the canal. Then they walked on to the polder Jansje's father owned. Part of it was very damp and was used for pasture. A fine herd of great black and white cattle were feeding on the thick grass. Jansje said her family made butter and cheese from the milk.

The rest of the tiny farm was given over to market gardening. Kathie looked all about curiously.

"What is the matter?" asked Jansje.

"I was looking for weeds," laughed Kathie. "We have such trouble with them."

"We never let them get a start," said Klaas. "We have so little land that we can't spare any for weeds."

Soon they were on their way back. They stopped at the tulip farm. Kathie was allowed to have all the blooms she could carry. Then they were back in the village and Kathie was saying good-by. Jansje rode to the home of Vrow Hals with her. On the way they made plans to write each other. It had been a wonderful day and out of it had come a real friendship.

QUIZ QUESTIONS

1. What great river flows from Switzerland to the North Sea?
2. What is found at the mouth of this river? Why is the soil so rich?
3. What country is located in the delta of the Rhine?
4. What other name is given to this country?
5. Is the Netherlands nearer to, or farther from, the Equator than Switzerland?
6. Is the Netherlands warmer, or colder, than Switzerland? Give two reasons.
7. How did the Dutch people make dry land out of the sea bottom? What name is given to such land?
8. What are dikes? Why are they needed? What are natural dikes?
9. How do the Dutch people drain the rain water from the polders?
10. Tell how the Dutch make use of the wind power, and why.
11. Tell about the rivers of the Netherlands.
12. What use is made of canals?
13. What crops are raised on the polders?
14. What is done with the fields that are too wet to grow crops?
15. Why do so many of the Dutch people live in cities and towns?
16. Name three interesting things about Dutch cities.
17. Tell about the Dutch houses. Why are they so different from Swiss houses?
18. Why might the Netherlands be called "The country of bridges"?
19. Why are bicycles in such common use?
20. What is a harbor? Name two large seaports of the Netherlands that have good harbors.
21. Name several kinds of goods brought to the Netherlands from other countries.
22. For what industry is Amsterdam famous?
23. Name other occupations of the Dutch cities.
24. What style of clothes are now worn throughout most of Holland?

SUGGESTED ACTIVITIES

1. Read the story of *Hans Brinker, or the Silver Skates* and tell it to the class.
2. Draw a picture of what you think a scene in the Netherlands would look like. Have an art exhibit of your drawings in imitation of the Dutch Art Exhibit.

Screen Traveler, from Gendreau

Ships traveling from the Mediterranean to the Red Sea pass through Port Said on the Suez Canal.

Unit XII

THE MEDITERRANEAN SEA AND LANDS

Far to the south of Holland lies a great inland body of water—the Mediterranean Sea. The word Mediterranean means "in the middle of the land." The sea is rightly named, for it is almost entirely surrounded by the lands of three continents. Europe lies to the north, Africa to the south, with a bit of Asia at the eastern end.

Gateways to the Mediterranean. Until the year 1869, the only water gateway to or from the Mediterranean Sea was the narrow Strait of Gibraltar at the western end. If Mediterranean ships wanted to sail to distant lands in eastern Asia, they had to go out into the Atlantic, around Africa, and then through the Indian Ocean to the Pacific. This was a long, dangerous voyage. To avoid it, goods were shipped overland by caravans. Caravans from northern Africa reached Asia by crossing the narrow neck of land, or isthmus, which joins these two continents. This neck of land is known as the Isthmus of Suez.

Goods from European ports, bound for eastern Asia, could also be shipped to the Isthmus of Suez by boat. There they had to be unloaded, carried across the Isthmus, and reshipped on the Red

Map of the Mediterranean Sea and the surrounding lands

Sea. Though this was shorter than sailing around Africa, it had its drawbacks.

In 1869, engineers completed a great canal, the Suez Canal, through the Isthmus of Suez, thus joining the Mediterranean and the Red seas. This canal is over 100 miles long, and steamers require 18 hours to pass through it. Ships are now able to sail up the Mediterranean, through the Suez Canal, into the Red Sea, and on into the Indian Ocean. Think of the time this saves and the ocean dangers which are avoided.

The opening of the Suez Canal has added greatly to the trade on the Mediterranean and has made of this inland sea a very important highway. Over it, ships of all nations are continually coming and going.

Ways of Travel. Should you wish to visit any lands along the European shore of the Mediterranean you could easily reach them from Holland in three ways. The quickest way would be by airplane. The trip would take but a few hours. Europe has many air lines, and connections are easily made with all important cities. You could travel by train, going south through the Swiss tunnels into Italy or across France. This would take many hours longer. Finally, you could take passage on a steamer and have a leisurely voyage through the North Sea and the Atlantic Ocean, and through the Strait of Gibraltar into the Mediterranean.

Why the Mediterranean Lands Should Interest You. The lands of Europe which border on the Mediterranean Sea are very lovely and have a wonderful climate. They lie wholly in the North Temperate Zone, so the sun is never directly overhead. In summer, the sun's vertical rays approach closest to the Mediterranean lands. They bring heat to these lands. In winter, the vertical rays

Brown Brothers

The Phoenicians, who were the first to build up a great sea trade, sailed from Carthage around the Mediterranean.

are farthest away, and the winds of the North Temperate Zone cool the air. Then the weather is that of land having a temperate climate.

There are only two seasons—summer and winter. In summer, these countries are sunny and warm, with little rain. How you would enjoy the fine air and the bright blue sky! Because the water reflects this wonderful sky, it also is a very beautiful blue.

In winter, there is a moderate rainfall, and the weather is cooler. Yet it is never very cold unless one goes back into the mountains. Along the coast, it seldom snows. Many people from other parts of Europe, and from other lands, come to the towns along the Mediterranean shore to spend a part of the mild winters. These towns are called winter resorts.

On the other hand, the Mediterranean countries in Africa and Asia are much drier and hotter, for they suffer from the dry, hot, desert winds. You know something of this from your study of Egypt.

Keep in mind, too, that there is much of interest to visit and see in the mild European lands. The scenery is beautiful and often unusual. The life of the people contrasts sharply with that of Holland. As for the cities, several are world-famous.

There is one special reason, however, why you should be interested in the Mediterranean lands. Thousands of years ago, great races of peoples dwelt along the shores of this inland sea, and built strong nations. They were highly civilized people, and much that they learned to do

has helped our own civilization. In fact, there was a time when much of the civilized world was centered around the Mediterranean.

Among the ancient nations along the Mediterranean were Phoenicia, which bordered on the Holy Land, in Asia; Egypt, an ancient nation in Africa; and Greece and Rome, in Europe.

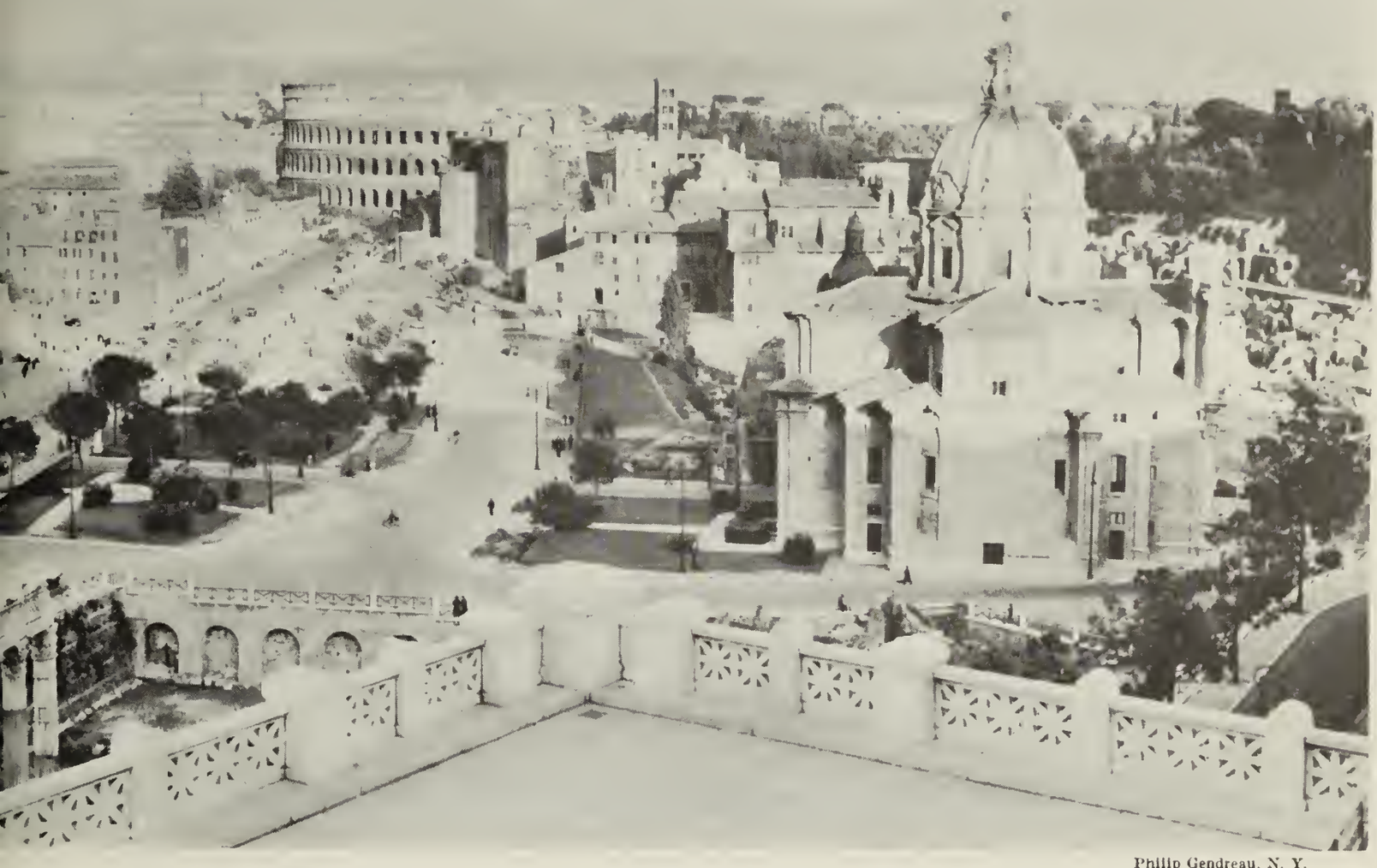
Sailing the Sea in Ancient Times. From the first, the Phoenicians, Greeks, and Romans used this nearby great sea as a means of travel between lands. But their boats were few in number and were small and unsafe. They were of wood, roughly made, and were driven by oars and sometimes by a small sail or two. Such boats could not face heavy storms. Many of them sank at sea or were wrecked on the rocky shores. Besides, they were very slow.

Is it surprising that the people of these ancient lands feared the sea, even though they sailed it? Many of their ships sailed away and never came back. The sailors faced so many real dangers that it was easy to imagine other dangers that were not real. People came to believe that there were monsters in the sea that destroyed ships and killed sailors.

There were, also, stories about the smoking mountains. These were the volcanoes that rise, here and there, near the northern shore of the Mediterranean. Sometimes, these volcanoes threw out stones, hot melted rock, and clouds of ashes that darkened the sky. This material, at times, destroyed towns and sank boats in the nearby bays or harbors. The people did not know that volcanoes are simply openings in the earth's surface. Through these, heated matter from inside

Ancient ruins tower above the modern city of Athens, Greece.

Publishers Photo Service



Philip Gendreau, N. Y.

Notice the ancient building in the background in this view of modern Rome.

the earth is blown out by steam and gas that form there. They imagined that angry beings in these volcanoes were trying to destroy them. They made up terrible stories of the dangers vessels had to face, when near a volcano. Vesuvius, in Italy, is the greatest of these volcanoes that caused terror.

In those early days, too, there were no maps and no ways of telling directions, when at sea. Sailors had to keep in sight of shore. If they went out of sight of land, they could not tell where they were. To get to the other side of the sea, they had to follow the coastline.

Very early, they learned to tell directions by means of the sun and stars, but in times of storms these helps were hidden from them. However, their love of adventure, their desire to conquer other lands, to plant colonies, and to trade, overcame all their fears.

In spite of the dangers, real and imagined, the Phoenicians, the Greeks, and the Romans sailed the Mediterranean. As they came to know the sea, they made rough maps to show the locations of different lands along its shores. Time went on, and they built larger and stronger ships. The ships went faster, carried larger loads, and were better able to meet heavy storms.

Ancient Nations Along the Mediterranean.

The Phoenicians were the first to build up a great sea trade. From their country, at the eastern end of the Mediterranean, and from their great city of Carthage in northern Africa, they sailed their ships

Philip Gendreau, N. Y.

The Rock of Gibraltar guards the western gateway of the Mediterranean.

all about this inland sea. In this way, they discovered new and distant lands with which to trade. Finally, they dared to sail through the Strait of Gibraltar. This is the deep, narrow passageway which connects the Atlantic Ocean and the Mediterranean Sea. This brought them to the Atlantic Ocean, and at length to the land which is now called England.

Perhaps the most important thing the Phoenicians did was to invent an alphabet. The alphabet we use today grew out of the alphabet the Phoenicians made so many years ago.

The Greeks. Greece, the home of the Greeks, is northwest of Phoenicia, on a part of the mainland of Europe that extends out into the Mediterranean Sea. Such a body of land, almost surrounded by water, is called a peninsula.

Like the Phoenicians, the Greeks became sailors and traders. Many of them were great artists and writers, who left us beautiful poems, interesting stories, and wonderful statues and temples. So beautifully made were these that, to this day, people of other nations use them as models.

The Romans. The Romans lived in Italy, another peninsula, which is west of Greece. If you look at your map or globe, you will find it stretching down into the middle of the Mediterranean. It looks somewhat like a huge boot.

The Romans were great soldiers, builders, and rulers. Their armies conquered many of the surrounding countries. In the lands they ruled, they built broad roads and wonderful buildings. The Romans also made wise laws for

governing these lands. So good were the Roman laws, that many of the laws of our country and other countries are copied from them.

Modern Nations Along the Mediterranean. As years passed, these early nations lost their power, and other nations sprang up along the Mediterranean. Yet the learning of the early peoples was never forgotten, but was handed on from age to age, from land to land, till it finally reached America.

Spain. At the western end of the Mediterranean, in Europe, is the country of Spain. Much of Spain is a high tableland. Most of the people are farmers. They raise grain and fruits, including oranges and lemons. A main crop is grapes, some of which are dried, to make raisins. For the first time in your journeys, you will see olives. There are many olive groves, and large quantities of the fruit or its oil go to other lands. An unusual product of its forests is cork, the very thick bark of the cork trees. Many of Spain's men are fishermen. The sardine fisheries are most important.

The Rock of Gibraltar. At Spain's most southern point, bordering the Strait of Gibraltar, is a small peninsula. On it, towers a great steep hill of bare rock, called the Rock of Gibraltar. Great Britain owns this rock. The British have cut tunnels and openings into its steep sides and have mounted huge guns to guard the strait. Gibraltar is probably the strongest fort in the world. In days of peace, all ships may pass it freely. But in case of war, an enemy who tries to sail through the strait would have a difficult time indeed.

Many ancient buildings remain in the small Italian villages clinging to the sides of the hills.

Philip Gendreau, N. Y.

Smoke is always trailing from the peak of Mount Vesuvius, and occasional eruptions send streams of lava down the mountainside.

Publishers Photo Service

Phillp Gendreau, N. Y.

Along the curve of the seashore and within sight of Mount Vesuvius lies the beautiful port of Naples.

France. To the northeast of Spain is France. The farms near the sea raise fine grapes and other products. Along the shore are great resorts, which are visited by people from all over the world.

Italy. Next to France is the boot-shaped country of Italy, extending far into the sea. The capital is Rome, the center of the ancient Roman Empire. Italy has a great backbone of mountains, which end in magnificent cliffs along the western shore. In fact, much of the scenery of Italy is unusually beautiful.

Italy is both an agricultural and a manufacturing country. There is not enough level land for the farmers, so crops are grown on the hillsides and lower mountain slopes. Terraces, like giant steps, are built up the steep slopes, by means of stone walls. On the surfaces of these terraces, grapes and other fruits are grown. Somewhat as Holland took land from the sea, Italy has turned large areas of marshes and swamps into farm lands, by draining or filling them.

Italy has no valuable coal mines to provide fuel for her many factories, so she uses electric power from her mountain streams.

Very many people live in Italy, so naturally there are many cities, towns, and villages. In some of the towns in the hills and along the seacoast, houses appear in rows one above the other, like the vineyard terraces.

There are a number of famous cities in Italy that you would enjoy visiting.

One is Rome—the same Rome that was the center of the early Roman Empire. Indeed, some of the ruins of ancient structures are carefully preserved. There are many magnificent buildings, old and new, in the modern city. Italy has had world-famous artists and architects, or designers of buildings, and some of their greatest work is to be seen in Rome.

Within the limits of Rome is the independent State of Vatican City. Here rules the Pope, Head of the Roman Catholic Church.

Far down the western coast is the large and beautiful city of Naples. Naples is built along a curve of the shore, and the harbor of this busy seaport is very beautiful. In plain sight from Naples is the great volcano, Mount Vesuvius. Smoke is always trailing from its peak. At long intervals, eruptions occur. Fiery explosions, deep in the mountain, send rocks and ashes far up into the sky. Streams of lava, or melted rock, flow down the mountain sides, destroying everything in their path.

Finally, you would certainly wish to stop at Venice. Here is a strange old city, with many splendid carved homes, public buildings, and palaces. It is one of the most beautiful cities in the world. You remember cities in Holland, such as Dordrecht. Its canals and rivers served in part as streets. In Venice, 150 canals largely take the place of streets. The Grand Canal divides the city into two parts. Instead of using automobiles and street cars, one usually travels in motor boats or in flat-bottomed boats with curved ends, called gondolas. If you are on foot,

Dividing the city of Venice into two parts is the main waterway, the Grand Canal.

H. Armstrong Roberts

Ewing Galloway, N. Y.

Threshing wheat. Horses pull a board, on which the Greek farmer stands, over the spread wheat stalks.

moving along the public squares and sidewalks, over 400 bridges help you to cross the canals.

Greece. East of Italy, and also extending as a peninsula far into the Mediterranean Sea, is the modern nation of Greece. On the same land stood the great and powerful cities of ancient Greece. The main city of Athens has grown up on the ancient city. On its hills and slopes, parts of great structures still stand to give some idea of the wonderful city of old.

The ancient Greeks were rich and powerful, but the Greece of today is weak, and its people are poor. The nation has suffered in recent wars. Moreover, most of the people are farmers, and the soil of their farms has grown poorer. However, some new land is being obtained in two different ways—by irrigating dry lands, and by draining marshes.

All over Greece, you would see the gray-green olive trees. So you would know that olives and olive oil are main products. Immense quantities of tiny grapes, called currants, are also grown. Some of the crop is dried and sold in other lands. Fine tobacco is also grown here. On the hillsides, where the grass is sparse, sheep and goats are raised.

Other Mediterranean Lands. Do you remember the crops grown in Egypt? From Egypt, from nearby Syria, and from the hot lands of Northern Africa come dates and figs and other tropical fruits.

New Citizens For Our Own Land. From the European countries on the

Mediterranean, many people have come to live in our United States. Perhaps there are children in your class who came, or whose parents came, from some of these Mediterranean lands. Perhaps they will point out on the map for you the lands from which they came, and will tell you something about the life in these countries.

QUIZ QUESTIONS

1. What is the name of the great body of water which lies south of Europe?
2. It is almost surrounded by what three continents?
3. What does the name Mediterranean mean?
4. What is the one natural gateway to the Mediterranean Sea?
5. What second gateway was made by man?
6. Tell of three ways of travel from Holland to the Mediterranean countries of Europe.
7. Name three great nations that bordered the Mediterranean in olden times.
8. Describe briefly the ships of these ancient people. Why was it more difficult and dangerous to sail these ships than it is to sail the ships of today?
9. Name a great volcano which the sailors of ancient times greatly feared. Why?
10. Is Spain a lowland country?
11. What farm products are common to all the European countries along the Mediterranean Sea?
12. How do the farmers of Italy make use of hillside lands?
13. What is Italy doing to gain more farm land?
14. Tell briefly about three great cities of Italy.
15. What great city of Greece was also a famous city in ancient times.
16. Tell about the farmers of Greece and their main crops.
17. Tell briefly about the African lands along the Mediterranean Sea.

MAP EXERCISE

1. Locate the Mediterranean Sea.
2. Show how one would travel by three ways from Holland to the European lands of the Mediterranean Sea.
3. Locate each of the Mediterranean lands.
4. What great island lies off the coast of lower Italy?
5. Locate a peninsula, a strait, a canal, a volcano.
6. Locate the Rock of Gibraltar and the Strait of Gibraltar.

TELL A STORY ABOUT

1. The Rock of Gibraltar
2. The Mediterranean Sea
3. Ancient Nations of the Mediterranean land
4. The Suez Canal

R. S. Vennerbeck, from Black Star

The waters of the ocean, which are always in motion, dash against the coast.

Unit XIII

SOME PEOPLE OF THE SEACOAST LANDS
NEW ENGLAND — NEWFOUNDLAND — NORWAY

So far, you have learned much about some of the lands of our world and little about its oceans. Now you will learn something of the oceans and of the seacoast lands. People of these lands make their living largely from the sea.

If you have tasted the ocean water, you know that it is salty. It is not good to drink. The waters of the Mediterranean Sea, and of other arms of the ocean reaching into the land, are also salty. Inland waters are seldom salty, although they carry a little salt picked up from the soil—usually too little to be tasted. It is these fresh waters that we drink. Sometimes an inland body of water is salty, because water flows in but has no way of flowing out. The sun draws some of the water up into the air, leaving the salt behind. The water remaining is much saltier.

The waters of the ocean are always in motion. Even when you feel no wind, the ocean rises and falls in long, low waves, called *swells*. During very heavy storms, the waves caused by the wind roll high enough to wash over the decks of the largest steamships. Along the coasts,

these large waves roll in and break on the shore.

Tides and Currents. One of the most interesting sights at the seashore is the tide. Twice each day, at regular intervals, the water rises for hours, creeping farther inshore with each wave. This is called *flood,* or high, tide. After rising for a time, the water slowly falls back and leaves the shore bare. Then we have *ebb,* or low, tide.

All of you have seen streams flowing through the land. Isn't it strange to think of streams flowing through the oceans? Yet there are great streams, or *currents,* in the ocean that flow for thousands of miles. In some of these streams, or currents, the water is cold; in some it is warm. Find these currents on the map on page 202. Notice the direction in which each current flows.

One warm current starts in the warm waters of the Gulf of Mexico, south of our country. It flows northward as far as Newfoundland, and then east toward Europe. This is the Gulf Stream. Another warm current, starting north of the Equator, flows past Japan across the Pacific and follows our western coast southward. These warm currents make the climate of the coasts along which they sweep much milder than it would otherwise be.

From the icy Arctic waters comes a cold current which flows down the northeastern coast of North America, touching part of our own country. The lands which it touches are cooler than they would be without this cold current.

The Seacoast. In some ways, the seacoast is as interesting as the ocean. The land along the sea is not the same everywhere. You may see low, flat, sandy beaches, and not far from them may be high rocky cliffs against which the ocean waves dash and break into white foam. Or there may be miles and miles of flat, muddy stretches, covered with tall grass. These are called *marshes.*

The coast line, in places, is almost straight. Elsewhere, long points of land, called *capes,* reach out from the shore into the water. Bodies of land almost surrounded by water are called *peninsulas.* The country of Greece on the Mediterranean Sea, you will remember, is a peninsula. What other Mediterranean countries are mainly peninsulas?

Where the ocean reaches far into the land, *bays* are formed. If the bays are deep and narrow, and are bordered by high, steep hills, they are called *fiords.* Bays and fiords, protected from storm winds by the land about them, make good harbors for ships.

Harbor Shipping. In the large harbors along the coasts are many kinds of ships. There are great ocean liners tied up at the docks. They are like beautiful floating hotels. Some of them are as long as two city blocks. Nearby are smaller freight steamers that carry goods all over the world. Perhaps there are a few ships with tall masts and many sails. These are used mostly for freight. Small fishing boats, most of them carrying sails, are here, too.

Tugs, strong little steamboats that tow other boats, puff noisily about the harbors. You may see them towing strings of several flatboats, or *barges,* fastened together, and loaded with coal or sand or brick. Other tugs may be busy helping big ocean liners to their docks.

Then there are the pleasure boats of all sizes. Handsome yachts ride at an-

Laurence Lowry, from A. Devaney, N. Y.

Lighthouses are placed at the entrances of many harbors and at dangerous places along the coast.

chor, waiting for their wealthy owners to come aboard. Beautiful sailing vessels skim about before the breeze. Tiny launches, driven by gasoline engines, glide in and out among the larger boats.

Sailors' Guide Posts. At the entrances to many harbors, and at dangerous places along the coasts, are lighthouses. A lighthouse is a tall tower with a powerful light at the top to guide ships and to warn them of rocks, reefs, and shallow places. These lighthouses are built and cared for by the governments of the different countries.

In some lighthouses, the light blinks on and off. In others, it turns, throwing a beam of light in one direction after another. Sometimes a colored light is used. Sea captains know these signals, which tell them where they are and what dangers to avoid.

In foggy weather, when lights show only a short distance, foghorns and bells are used to warn and guide the ships.

Not all parts of a harbor are equally deep. In most harbors, buoys are placed to mark the deepest channel, or passageway, through which the large ships must sail. Some of these buoys are just wooden stakes. Others look like large metal barrels. They show lights at night, and those at points of real danger have bells or whistles that sound continually.

Each harbor has its pilots—men who know the harbor channels and the dangerous rocks and sandbars. They go out to meet incoming ships and guide them safely to their docks.

Ewing Galloway

The motion of the water rocks this buoy and causes the clapper to strike a bell.

The Fishing Industry. Many of you have gone fishing just for fun. But many people who live on the seacoasts make their living by fishing. The ocean is a great source of food, including fish, clams, oysters, and lobsters. Some fish are caught along the shores. This is called "inshore fishing." When fish are caught far out at sea, it is called "deep-sea fishing."

Newfoundland. At the mouth of the Gulf of St. Lawrence, off the eastern coast of Canada, is the island of Newfoundland. It is a land of hills and valleys, forests, and rocky headlands. Deep fiords provide fine harbors. The winters are severe and storms rage in from the sea. The climate of Newfoundland is so cold that few crops can be grown. This is due to its distance from the Equator and to the cold Arctic Current which flows near it. The people are forced to get most of their living from the sea. Most of the fishermen are descendants of the French, who founded the first settlements in Canada. Many have their homes along the rocky shores of the island of Newfoundland. The excellent harbors and the fine fishing grounds nearby make the fishing industry highly successful.

The Atlantic Fisheries. The water for hundreds of miles off Newfoundland's southeast shore is very shallow as compared to the rest of the ocean. This shallow area is known as the Grand Banks. Years ago, even before the coming of settlers to our country, the people of Europe went to the Grand Banks to fish.

There they found immense schools of cod, halibut, and mackerel. Lobsters, herring, and seals are other products of these waters. The seals are used for their oil, and for their skins, from which leather is made.

Some of the early colonists of our country made their homes along the rocky northeastern coast, to which they gave the name "New England." At first it was a struggle to keep alive. The sea offered them the best means of making a living. So, in the beginning, many of them built ships and became fishermen. The nearby waters were their fishing grounds, and the boats would come home laden with halibut, cod, herring, and mackerel.

As the colonists increased in numbers, more fish were needed, and the fishermen went farther away for their catch. They finally reached the Grand Banks and other banks off the New England coast. To this day, these banks are the best fishing grounds for the New England fishermen.

Though fishing was the chief industry of the colonists, they needed other things besides food. So they built large sailing vessels and traded their products with countries across the sea.

Their life on the rocky coast, and their battles with wind and waves and storms, made these seacoast people strong, brave, hard working, and independent. In the War for Independence, which came later, these qualities helped win the fight to make our country free.

Many of the descendants of the early colonists live today in the fishing towns

Fishing boats crowd the harbor at Gloucester, Massachusetts.

Philip Gendreau, N. Y.

H. Armstrong Roberts

Fishermen in villages along the New England coast leave their homes early in the morning to get their catch.

along our northeastern coast, and make their living much as their forefathers did.

Gloucester, a Fishing Town. One of the most important of the New England fishing towns is Gloucester. For over two hundred years Gloucester has been a fishing center. Hundreds of fishing boats fill its harbor.

Fishing is still good along the New England shores, and some of the fishermen go out each morning and return to their homes each night. Most of the Gloucester fishermen, however, go in the schooners to the great fishing banks, far off the coast. They stock their ships with food, and with salt for preserving the fish they catch. With plenty of lines and nets, they sail out of the harbor and are gone for days or even for weeks. Some small steamers are also used in this industry.

There is anxiety in the hearts of the fishermen's wives until the ships return home. The great fishing banks lie in the path of many huge ocean liners that travel back and forth between America and Europe. Dense fogs cover the water during much of the year. The steamships, unable to see the fishing boats, sometimes plough right through them. Many fishermen have lost their lives in this way, and in the great storms.

Though the fish are already cleaned when the boats unload them at the wharves, there is still much to be done. Some of the fish are packed in ice and shipped as fresh fish to all parts of the country. Some are "salted down" to preserve them. Others are dried or smoked,

Massachusetts Department of Commerce

Gloucester has been one of the world's fishing centers since colonial times.

so that they will keep a long time. It is not unusual along the shores to see racks and racks of fish spread out to dry. Besides caring for the fish, there are other industries to be carried on in a fishing town. The parts of the fish which are not fit for food are made into glue. The boats have to be kept in good condition. Nets, ropes, and other things the fishermen need are made in local factories. Gloucester is a busy place.

To get a view of the New England fishermen and their work, let us look in on Mark Bradford. He lives in a little fishing village near Gloucester.

MARK'S TRIP TO THE GRAND BANKS

Mark woke early that warm June morning. He was downstairs by the time his mother was starting breakfast. Today he was to begin a great experience. It was to be his first trip to the northern fishing banks on his father's fishing schooner, the *Nancy*. The trim and speedy craft was named after his mother.

In the living room fireplace a driftwood fire burned brightly, driving away the chill of the night. Mark set the table, meanwhile talking steadily to his mother through the open kitchen door. Presently his father came in, shedding his wet oilskin coat.

Mark looked out at the dense fog that shut from view even the cottage across the way. "Will it clear by flood tide, Dad?" he asked anxiously.

"It will be lifting," his father smiled. "We'll have clear weather when we pass

Boats with their sails loosened, whip across the open water on windy days.

the Head." The Head was a high cliff at the gateway out to the ocean.

They sat down to breakfast—brown beans, baked in a pot all night, codfish cakes, New England brown bread, coffee, and milk for Mark. And, according to village custom, there was a piece of apple pie to top it off.

After breakfast, the good-bys were soon said. His mother kept a bright smile when she hugged him, but Mark knew she was serious underneath. Fishing on the great banks was full of dangers.

The fog was thinning. The rows of drying racks and the salting and packing sheds showed dimly. The scent of fish was strong in the air, but Mark and his father did not mind it. They had been used to it all their lives. They found that the water was almost touching the top of the wharf. But the *Nancy* was tugging at her mooring ropes. That showed the tide had begun to ebb.

On deck, everything was shipshape. The dories, or flat-bottomed rowboats used in fishing, were nested, or fitted into one another on the deck, instead of being towed behind. Slower boats often towed them. The sails were loosened. The *Nancy* had a gasoline engine as an emergency helper. It was warming up.

They cast off. As the *Nancy* swung into open water and chugged slowly into

the channel, marked by two rows of buoys, the sun broke through. White, fleecy clouds appeared in a blue sky. Even Mark knew there would be wind later. He watched the buoys. The first were long, thick, red and white poles anchored to the harbor bottom. Usually a sea gull perched on the tip, watching for food in the water. Later, near the harbor entrance, huge, red barrel buoys were seen. Some had bells on top that clanged as the buoys dipped in the ocean swell. Then Mark stared up at the Head and at the tower of the lighthouse on it. Beyond the Head lay the open ocean. The engine stopped. The sails went up, and the *Nancy* responded to the breeze as the wind filled the sails. They were off!

That first day was wonderful. A part of the Gloucester fleet came out and they joined it. All about were sails. Now and then, some ship challenged another to a race. It was early afternoon, when the breeze was getting stronger, that the *Swordfish* hailed and challenged the *Nancy*. Both ships put on all sail. The boats picked up speed. Spray drove over the bows.

"Will we beat 'em?" asked Mark of the old sailor at the wheel.

"Both ships are good, lad," said the man, "but your father, he's the better skipper."

For hours the ships changed direction, trying to get the wind at a better angle. It was late afternoon when the *Nancy* picked up speed and shot ahead to win the race.

The next day the fleet was well scattered, with the *Nancy* still in the lead. Mark found much to watch—the changing coastline, the coastwise steamers.

Some men fish with long trawl lines, which they drop into the water in a wide circle.

Ewing Galloway, N. Y.

On many fishing banks, fish are caught in nets instead of trawl lines.

Once, when they had moved farther offshore, a great ocean liner swept by. From the *Nancy's* deck, it seemed to tower almost to the sky.

Late in the afternoon, Mark saw the ocean water disturbed over an immense area. Above, a great flock of gulls and other sea birds were flying madly about or darting into the water. Through his father's glass, Mark could see each had a fish.

"A school of mackerel," said his father. "Millions of them. They are after the little fish and are chasing them up to the surface. That gives the gulls a chance to catch some of the little ones, too."

"Wouldn't it pay to stop and net a load of mackeral?" asked Mark.

"We're after cod," said his father. "Cod are more in demand."

It was a night later that Mark woke from a sound sleep to find the ship pitching heavily. He barely saved himself from being tossed out of his bunk. Outside, the wind was whistling through the rigging, lightning was flashing, and thunder crashed. He staggered to a porthole. The flashes showed a wild and angry sea, with great billows rolling by, their tips blown off in foam by the gale.

His father came in. "Put on your oilskins, Mark. Button them tight and put

on a belt. I'm taking you out for a moment to see the storm. Hold on to me. Don't leave my side for an instant."

Once outside, Mark had no desire to wander about, even if he could. The deck reeled under his feet. The sails were furled, so he could see forward. They were headed into the storm. Great billows rolled in, crashing over the bow and rolling over the deck. The spray felt like tiny pebbles when it stung Mark's face. Once a lightning flash was close and balls of fire seemed to roll through the rigging. It did not seem as if the little ship could live through such a battering. Mark looked up at his father's face. It was perfectly calm.

The next morning, the storm had passed, leaving behind a rough sea and a bracing wind. The day after, the air grew cooler. Then the crew suddenly became busy, getting the dories ready, and going over the fishing tackle. They were approaching the fishing banks.

Then came the fishing. At early dawn, one by one, the dories were launched at points far apart. Each dory contained two men and a mass of tackle. The hooks had already been baited. Mark went as an extra in a boat manned by two experienced fishermen from his own village, Sam and Abner.

After rowing a bit, they let down a weight attached to one end of a long line, or *trawl*. Then the line was "payed" out into the water. It was kept at the surface by small floats. Between the floats, short lines hung from the main line, with baited hooks at their ends. The trawl was many hundreds of feet long and took some time to set and anchor at the other end. Then the men were picked up by the *Nancy* and had lunch. Three hours later they were on the way back to the trawl.

Now came the hard work. One by one, the short lines were hauled up. If a cod was caught, it was lifted into the boat, and the hook was again baited. Mark tried a few but soon found his arms aching. One variety of cod weighs about twelve pounds. The larger variety runs from 20 to 35 pounds, with some much heavier. The dory was very low in the water when the end of the trawl was reached. Soon the *Nancy* sailed around to pick them up. After that, the crew worked far into the night, cleaning and salting the catch.

Several days went by. The men showed the strain of the work. Other schooners could be seen here and there in the distance. The banks are so large that the crews seldom get in each other's way.

One afternoon, while hard at work in the dory, Abner raised his head. "Listen!" he said. "It's the *Nancy!*" The faint sound of a distant foghorn was heard.

Sam sat up and looked about. From the east, towering high, a thick wall of fog was rolling in. It seemed to Mark like something solid and threatening. Meanwhile, the men had snatched up the oars and begun to row in the direction from which the horn had sounded. They could not outrace the fog. A mist formed around them. Then the dense bank rolled over and covered them. Mark could hardly see the length of the dory.

"It may be a long time, son, before they can find us, but we carry food and water, so don't worry," said Sam.

"Not with you two along," Mark managed to say.

The wait seemed endless. They ate a little and talked a little, but the fog made

Philip Gendreau, N. Y.

This floating mountain of ice towers high above the sea. At least seven times as much of the iceberg is beneath the sea.

breathing difficult. Only after what seemed like hours, the *Nancy's* horn sounded faintly. Slowly it grew louder, then faded.

"She's poking around," said Abner. He reached into the boat locker and pulled out a rusty tin horn. But he didn't blow it. "Too far away yet to be heard," he said.

The hours crept by. Now and then, the *Nancy's* horn sounded far off. Then, at last, it sounded louder. Abner took up his horn and began to blow in return.

"Look!" cried Mark, at long last. He pointed. Vaguely, the *Nancy* was taking form in the fog, slowly drifting down on them. Then came a hail from its deck and, shortly, they were aboard, the last to be picked up.

But the fog danger was not over. Other boats were about, and horns continued their dismal warning. At dinner, a call came from Mark's father, for he had not left his post. "All on deck!"

They hustled up. And then they caught it! A deeper horn was sounding, and it grew louder fast. Mark knew a big steamer must be bearing down on them.

"Stay close to me," his father told Mark, his voice tense.

The air vibrated with the noise. The *Nancy's* horn sounded between the blasts of the stranger. Would it be heard? The answer to that came when the steamer's whistle signaled. But there was still danger. They might be cut down, since neither could see the other. Then, the

great ship loomed faintly. The *Nancy's* engine labored to pull the schooner to one side. The steamer passed so close that her wash rocked the little sailing ship. The steamer saluted with her whistle and picked up speed.

Good fortune was with the *Nancy*. In the days that followed, her fish tanks filled rapidly. She was about ready to sail homeward when she was hailed by a trim white steamer of the United States Coast Guard. It gave warning of icebergs that were drifting south into their path.

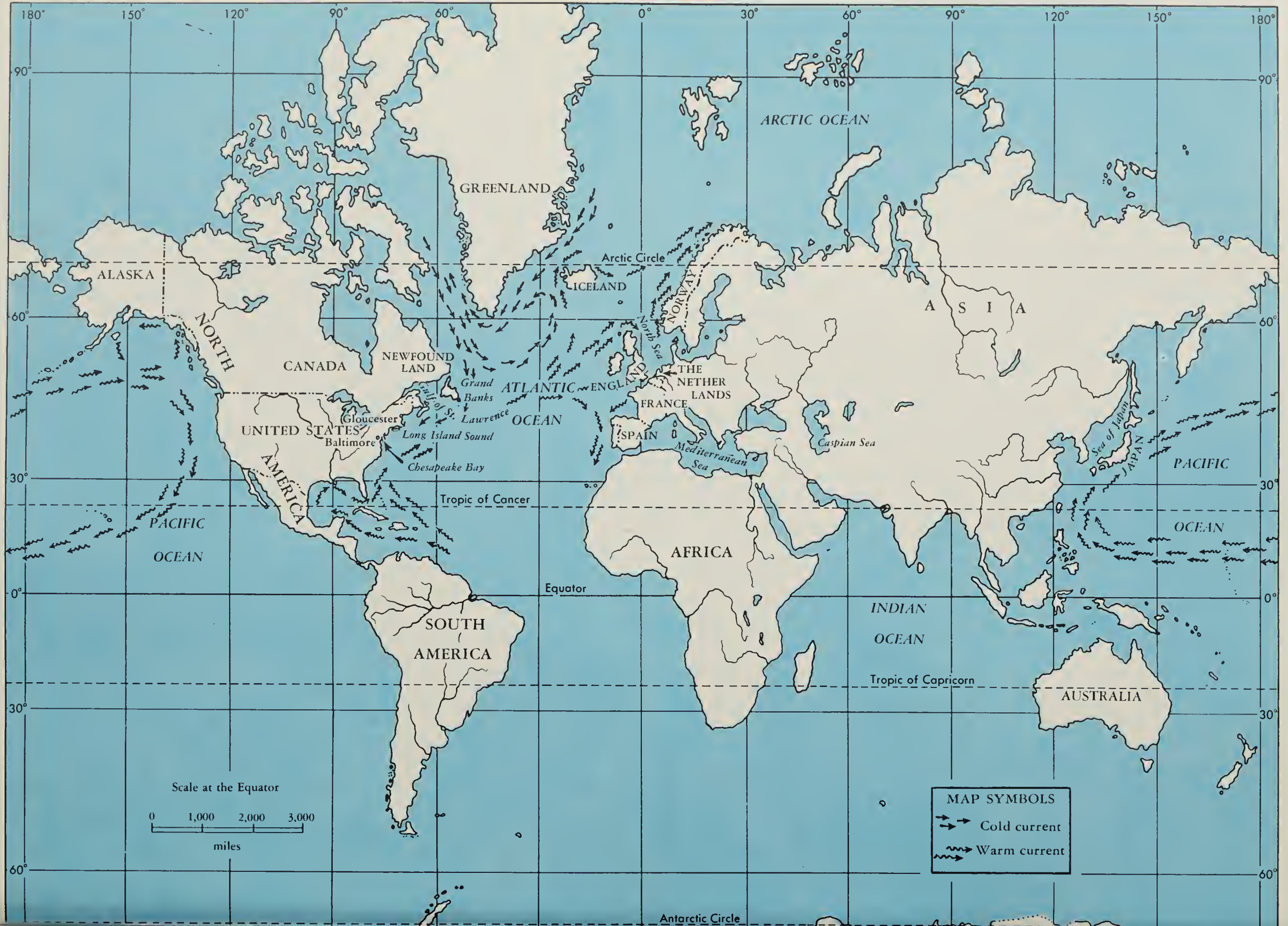
That night, double watch was kept aboard the *Nancy*. Icebergs are giant masses of floating ice. Many ships have been sunk by collision with them. By midnight, the watchman knew that icebergs were near, for the air became very chilly. But it was not until late dawn that a warning came and all the crew turned out. The ice mountain towered from the sea not a quarter of a mile away. The tip of the highest peak was pink from the coming sun. Mark knew he would never forget the beautiful sight.

Steadily the *Nancy* traveled southward. The chill of the Grand Banks and the cold current grew less severe. One morning, they stood off the Head and came in on the tide. First back, and with a full load, the *Nancy* was moored at her pier.

Feeling years older, and very much a young sailor home from the sea, Mark

Fully grown oysters are scooped or dredged, packed in ice, and shipped all over the world.

H. Armstrong Roberts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Gulf of St. Lawrence
Gloucester
UNITED STATES
Baltimore
Long Island Sound
Chesapeake Bay
SPAIN
Mediterranean
Sea
Caspian Sea
Sea of Japan
JAPAN
PACIFIC
OCEAN
Tropic of Cancer
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OCEAN
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INDIAN
OCEAN
Tropic of Capricorn
AUSTRALIA
Scale at the Equator
0
1,000
2,000
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miles
MAP SYMBOLS
Cold current
Warm current
Antarctic Circle

Publishers Photo Service

A harbor shelters the fishing fleet from strong winds and rough waters in Norway's fiord coast.

was first off. He ran toward his mother, who was waiting with the other village women. This time, she was really smiling.

SOME OTHER SEACOASTS AROUND THE WORLD

When you think of the four great oceans and the seven continents, you realize there must be an immense number of miles of seacoast in the world. But a lot of it does not have the harbors, or the fisheries, or the fine beaches to attract people to the sea life as does our Atlantic seacoast.

Our own country is very fortunate. Along the Atlantic Ocean from New England to Florida, and around the Gulf of Mexico are many harbors, good fisheries, and fine beaches. There are others up our Pacific coast, even to Alaska in the Far North. Do you remember the summer resorts on the New Jersey coast? Florida beaches attract hosts of vacationists, especially in winter. Along the Florida coast, 600 kinds of fish can be found. In the Northern Pacific, the salmon fisheries are best known.

Sea Foods. As you know, not all sea food is fish. Oysters are one of the chief sea foods of our country. They seem to like the partly fresh water near the mouths of rivers. They are found in shallow water in bays along the northern half of our eastern coast. Chesapeake Bay

has the largest oyster industry, with Long Island Sound second. The city of Baltimore on Chesapeake Bay is one of the great oyster fishing centers of the world.

Men who make a business of oyster fishing scatter broken oyster shells over the bottoms of the shallow bays. Young oysters attach themselves to these shells and cling to them while they are growing. When the oysters are fully grown, they are gathered up by means of scoops or dredges. They are then packed in ice, and shipped all over the country.

Lobsters are found in the cooler waters of our North Atlantic Coast. Clams are found in the mud flats along the northeastern coast of our country. The fishermen go to the flats when the tide is out and dig for the clams, which are buried several inches deep in the mud. Great quantities of clams are gathered in this way. They are then shipped to different places to be sold. Sea turtles are captured off Virginia and at many other points.

Norway. You remember that many of the Dutch are fine seamen, because they are near food fisheries and have fine harbors. Their fishing banks are in the North Sea where there are great shallow areas that remind one of the Grand Banks.

North of Holland, and bordering on the North Sea and the Atlantic, is the long, narrow country of Norway. For its size, it has a great length of seacoast. It is a mountainous country, and many of its mountains meet the sea, towering thousands of feet above it. Winding fiords extend far inland, forming harbors safe from any storm.

Norway sends steamers to the Arctic and Antarctic regions to hunt whales. See the harpoon gun in the bow.

Brown Brothers

Norway extends so far north that there are nearly three months in winter when the sun does not shine. For three months in summer, it never sets. But the Gulf Stream flows along the shore and keeps the climate mild.

Naturally many people of Norway make their living by catching fish. Norway is close to the North Sea fishing banks. There they catch cod, mackerel, herring, and salmon. Its seacoast, like our northeastern coast, is rocky.

For hundreds and hundreds of years, the Norsemen have been brave and daring seamen. They were not afraid, like most people of early times, to go out across the ocean. Long, long ago they built strong little ships and ventured out in them farther and farther west. Nearly a thousand years ago, they discovered the islands of Iceland and Greenland in the cold regions of the North. From there, they pressed on and finally landed on the shores of North America, hundreds of years before any other people of Europe. The people of Norway still love the sea, and depend on it for much of their food.

Whaling. Whales, great fishlike animals, live in the sea and are hunted in large boats. Whales are the largest animals in the world. They are most commonly found in the cold ocean waters of the Arctic and Antarctic regions. More than any other nation, Norway sends steamers to these oceans to hunt the whale.

When a whale is sighted, a harpoon, or spear with a rope attached, is thrown or shot at it. If the shot is good, the spear enters the whale's flesh and holds there. Maddened by the pain, the wounded animal lashes the waters furiously. Sometimes he charges at the boat. Before the days of large boats, whaling was a dangerous business, as many a small craft was wrecked by the swish of a whale's great tail.

After the whale is dead, it is drawn up to the boat and either cut up there or towed to port. Valuable oil and bone are obtained from the bodies of whales.

Some of the newest whaling ships are like great floating factories. Their crews kill the whales easily and safely by firing an exploding harpoon from a cannon. When a whale has been killed, a great door opens in the bow of the ship, and the whale's body is dragged up onto the deck of the ship by means of machinery. The body is quickly cut up, and the useful parts are stored in huge tanks. Such modern methods have made whaling safe and easy, but they have taken much of the adventure out of whaling. Whales are now becoming so scarce that it is necessary to forbid whalers to kill more than a certain number each year.

Japan. Japan is a country of many islands off the eastern coast of Asia. Before World War II, it led all the world in the quantity of fish it caught. Between the islands and the mainland, and protected from the winds of the ocean, is a large sea, called the Sea of Japan. It is really a part of the Pacific and is rich with fish. Here the Japanese fishermen come in their small boats, which are not built to face the heavy storms of the open sea.

The Caspian Sea. In the warm waters of the salty Caspian Sea, between southeastern Europe and Asia, men go out in boats to catch sturgeon. These are great fish, often larger than a man. When a sturgeon is hooked, it takes many men to draw it to the boat. Sturgeon eggs, called

roe, are made into caviar. Caviar is popular with many people, but it is expensive.

Other Seacoast Industries. Living near the water, many of the people of the coast towns prepare the products of the sea for market and ship them. Others are engaged in shipbuilding. They not only build ships, but sail them to far-off lands. In this way they carry to other nations the products of their villages and country, and bring home goods which other peoples make and supply to them. Each nation, you see, makes use of the materials at hand, and trades its products for those of other lands.

QUIZ QUESTIONS

1. How is the water of the ocean different from that of inland lakes and streams?
2. What is meant by the ocean swell?
3. What are tides?
4. Tell briefly about the ocean currents.
5. Name at least three kinds of seacoast.
6. What is a cape?
7. What is a peninsula?
8. What is a bay? What is a fiord?
9. Name several kinds of ships found in the large harbors of the seacoast.
10. What is a lighthouse? Tell two facts about lighthouses.
11. Is there a buoy or a lighthouse near your home? Where?
12. What is the difference between inshore and deep-sea fishing?
13. What great fishing grounds are near Newfoundland? Describe them. What fish are caught there?
14. What is done with the fish which the ships bring home to Gloucester?
15. Explain the process of trawling.
16. Remembering Mark's experience, tell some of the dangers of deep-sea fishing.
17. Tell about other fisheries along our own seacoasts.
18. Where is Norway? Tell about some features of this land.
19. Where do the Norwegians fish? What fish do they catch?
20. What creature do they hunt far from their own land? Tell about this industry.
21. Tell about Japan's fishing industry.
22. What great fish is caught in the Caspian Sea?
23. What industries are common seacoast activities?

MAP EXERCISE

1. Locate the Grand Banks.
2. Locate the Gulf of Mexico.
3. Locate Alaska.
4. Locate Norway and the North Sea.
5. Locate Japan and its fishing grounds.
6. Find the Caspian Sea.

SOME THINGS TO TALK ABOUT

1. Tides
2. How buoys, lighthouses, and foghorns protect sailors
3. Ocean currents and their effects on the lands they wash
4. Trawling for cod
5. The dangerous life of the seacoast fisherman
6. Icebergs
7. Gloucester

Philip Gendreau, N. Y.

The 2500-mile-long Great Wall of China was built to keep out fierce tribes from the North.

Unit XIV

CHINA, AN ANCIENT LAND OF MANY PEOPLE

Have you ever thought how much you learn from other people and from visiting new places? When you play with new friends, you learn new games. From your schoolmates, you learn of new and interesting hobbies. You find out how to make many new things by seeing other people make them. You see and hear a radio or a television set, and you want one at home. You ride in an automobile, a train, a steamship, or an airplane, and you can understand how these have improved the earlier ways of getting about. In your travels and in your study of geography, you learn how other people live and why they live as they do. All this helps you in knowing how to live.

But suppose you kept away from other people and places. Suppose you knew little about the rest of the world, or even your own country. Suppose you knew nothing of railroads, or automobiles, or radios, or airplanes, or other useful machines that give us pleasure and help us today. Do you think your life would be as enjoyable and comfortable as it now is? Of course not.

It is the same way with countries. The more the people of one country know about the people of other countries, and


ARCTIC OCEAN
Arctic Circle
EUROPE
ASIA
DESERT OF GOBI
CHINA
DESERT PLATEAUS
ARABIAN DESERT
THAR DESERT
INDIA
Hwang
GREAT WALL
Peiping
River
Hankow
Shanghai
Yangtze River
Canton
Tropic of Cancer
JAPAN
PACIFIC OCEAN
INDIAN OCEAN
JAVA
ASIA
SCALE OF MILES
0 100 300 500
MAP SYMBOL
Great Wall of China

the more they meet and trade with them, the better off they are. But if a country shuts itself away from other countries, after a time it is bound to fall behind the rest of the world in newer and better ways of doing things.

A Shut-Away Land. On the other side of the world, in Asia, lies the huge land of China. It has been a civilized nation longer than any other nation in the world today. Yet for centuries, when powerful modern nations were growing up, it shut itself off from the rest of the world.

Large parts of this immense land have few people, but other parts are densely crowded. More than one fifth of all the people in the world live in one part of China. This part is only one half as large as our United States.

China is far around on the other side of the world. Find it on the globe. You can travel either east or west to reach it. From New York, you can go by steamer across the Atlantic, through the Mediterranean Sea, to the Suez Canal. From here, you sail the length of the Red Sea, cross the Indian Ocean, and sail through the waters of the Pacific Ocean to the big city of Shanghai in China.

You can also reach China by sailing south from New York through the Atlantic Ocean and through the Panama Canal between North and South America. Then you cross the Pacific to Shanghai. You may also sail from San Francisco directly across the Pacific to Shanghai. If you prefer to go by air, the most direct route is from the Pacific coast of our own land across the ocean in an airplane.

The Great Wall. For thousands of years, the Chinese shut themselves up, largely in the southeastern part of Asia, away from the rest of the world. They did not know about the wonderful things other people were doing. There were reasons, of course, why they kept to themselves. To the west are high mountains and desert plateaus where few people can live. To the south are great jungles. To the east is the Pacific, and the Chinese had not learned to build ships for ocean travel.

To the north, beyond the Chinese plains, was another country. Its people were so fierce that the Chinese built a great wall to keep them out. This wall, with its curves over and around the mountains, is about 2500 miles long and has 4000 watchtowers. It took many years to build it by hand. It is still considered one of the great wonders of the world.

Travel in China. The Chinese did not travel much, even in their own country. There was some travel by boat on the great rivers. Their roads were very poor. Most of the people walked, when they had to go anywhere. Some hired others to push them in wheelbarrows, or to draw them in high, two-wheeled carts. Others traveled in chairs fastened to two poles, the ends of which were carried on the shoulders of men. Even goods were tied to poles and carried over the shoulders, or were packed on donkeys. Most people, however, just stayed at home.

Even today, in spite of the vast numbers of people living in China, there are few railroads. There are few good roads, and not many automobiles. Most Chinese still travel in the old ways.

Chinese Inventions. In very early times, the Chinese learned to do certain things well, as they were very skillful. In some ways, for a time, they were ahead of all

Philip Gendreau, N. Y.

Traffic in a Chinese street. How does it differ from that in America?

the rest of the world. They were the first people to invent a compass. They were the first to use a printing press. They were the first to make fine silk. They discovered how to make and use gunpowder before anyone else did. They early learned to make beautiful jars and tiles. They also learned to build wonderful buildings long before many other countries did. They worked out many good rules for right living.

However, as time went on, the Chinese failed to learn what other countries were doing and thinking. They knew nothing about the many machines, used in other countries, which did work formerly done by hand. They simply went on doing the same things their fathers and grandfathers had done, and in the same way.

Only in fairly recent years have they been willing to have much to do with other nations. Though some of the cities now have factories where products are made by machinery, it will take a long time for China to catch up with the progress of the rest of the world. Back in the interior are millions of people who still live in the old way.

One main reason there is so little machinery in most parts of China is, strangely enough, that there are so many people who have to eat and work. For centuries, they have suffered from flood and famine. They have learned to get along on very little. To get this little, they work for a low wage. Thus a piece of work done by hand supplies many people with work at a low cost.

Ewing Galloway, N. Y.

Many famous temples, such as this one in the old capital city of China, are still in good condition.

The Chinese peasants are the hardest working people in the world.

The Great Rivers of China. You remember how the Nile River gave Egypt her fertile soil and the water to make crops grow well. In the same way, China has two great rivers, besides other streams, that make it possible to raise crops for the millions of people. These rivers are the Hwang and the Yangtze. Both rise far back in the mountains and flow eastward across China to the Pacific. Embankments line the rivers, to keep the water from overflowing the land when the streams are high. But sometimes breaks occur, or the water rises higher than the banks.

When these rivers overflow their banks, they often cause terrible floods. But they leave behind rich soil in which crops grow well. These rivers have also brought so much soil down to their mouths that they have gradually built up great, low plains along the coast. So broad are these plains, that cities which were once on the seacoast are now many miles inland. The plains are used as rice fields.

The Canals. The Hwang and the Yangtze flow far apart by the time they reach the low hills and plains, yet great areas between them grow crops. How is that? The answer is—canals. Probably China has more miles of canals than all other countries put together. They run far inland from the rivers. They have many branches and, from these, ditches carry water to the thirsty crops.

The canals serve also in place of roads. There are few good roads outside the

cities. In most cases, they are narrow and unpaved or are mere footpaths. But the canals can be used by the sampans, or small boats, to get from point to point.

Farms and Crops. Very many of the people of China are farmers. Farming is held in high honor. There are so many people in China, and the need for food is so great, that every bit of good land must be used to grow food. If a man has a bare rock ledge in his field, he will cover it with soil, scooped from the bottom of the nearest canal or ditch, and build a wall or terrace around it. Terraces are even built high up the mountains, to make room for crops. Moreover, the farms are very small, so that each must produce as good, and as many, crops as possible. Few cows and sheep are raised, because ground cannot be spared for pasture. At most, a cow or a water buffalo is kept. Both these animals have to work, drawing plows or carts. Chickens and pigs are raised, because they do not take up much room. The Chinese keep dogs mainly as watchdogs.

This water buffalo is plowing up the rice field.

Ewing Galloway, N. Y.

The Chinese are among the best gardeners in the world. Since few animals are raised, the people live largely on their garden crops. In southern China their foods are mainly rice, beans, greens, and vegetable oil.

In northern China little rice is used. Wheat, barley, a kind of corn, beans, and sweet potatoes are grown for food. Many of the people are very poor and must live on what they can grow best at home.

Besides their food products, the Chinese raise an immense amount of cotton and great numbers of silkworms. The cotton is mostly used in their own country, but Chinese silk is known all over the world.

Except that China has heavier summer rainfall than the United States, somewhat the same kinds of climate are found in the different parts of the two lands.

Rice. Rice is a swamp plant and grows best on wet lands. The fields of the Chinese rice farmers are low and perfectly flat. The farmers build low walls of clay around them. After this, they flood their fields by letting in water through ditches from canals leading from the rivers. Sometimes, they have to pump or carry the water by hand. In the shallow water they set out the rice plants. When the rice is ripe, they drain off the water, gather the stalks, and leave them to dry. Later, they thresh the rice grains by hand.

As soon as the rice crop has been harvested, the farmers dig up their fields and plant wheat or barley or vegetables. In this way they make their fields give

them two or more different crops each year.

Tea. Tea is a very important crop in China. The Chinese are great tea drinkers. They also send much tea to other countries. The tea is made from the leaves of a tea bush. The seeds are first planted thickly in small beds of very rich soil. When the tiny plants are well sprouted, the farmer replants them quite close together in his field, and cultivates them very carefully. No leaves are picked until the plants are three years old. After that, the Chinese women and children go into the fields three times a year to gather the leaves.

Brown Brothers

Chinese women and children gather tea leaves three times a year.

In preparing leaves for black tea, the leaves are dried in the sun. Then they are put between rollers that roll them until they curl up. After that, they are roasted over a fire until they turn black. They are then packed in tight boxes which keep out moisture. In preparing the leaves for green tea, the leaves are roasted or steamed as soon as picked. Later, they are rolled and roasted again. Both green tea and black tea can be made from leaves of the same bush.

The Tallest Grass in the World. Did you ever use a bamboo rod when you went fishing? Then you know how bamboo looks. It has round, ringlike joints every few inches up its smooth stem. Bamboo grows in groves in Eastern China. The stems grow from a few feet in height to over one hundred feet, according to the variety. Yet bamboo is not a tree, but the tallest grass in the world. Like grass, it grows rapidly, often as much as a foot a day.

For the Chinese, bamboo is an all-purpose plant. They consider it a great gift of nature. The tender young sprouts are eaten like asparagus, pickled, or cooked with other foods. The seeds are a grain which can be used like barley for food. As for the reeds, or stems, they are used in endless ways. Houses are built of them or they are used for roof poles. Furniture of all kinds is made of bamboo. Since the stems are hollow, large sections

are used for pipes, and short lengths for cups and buckets. Paper, hairpins, and window shades are other products made from this wonderful grass.

A Day with Yen Foo on a Farm. Suppose we see how Yen Foo, a boy of about your age, spends a day on his father's farm. We will call him Foo. In China, one's first name is the family name. The farm is on the broad plains between the two great rivers. But Foo does not live on the farm. None of the farmers around him do. They live in little villages and walk out to their farms each day.

If you went to the village and were directed to the Yen home, you would pass through a gateway and passageway into an inner court. Children are playing on the hard-packed earth. A few chickens and a pig are wandering about. Around the court are a number of houses. Old grandfather Yen and his grown-up sons and grandsons, with their families, live in these houses. A family name means much to the Chinese.

Bamboo — the tallest grass in the world.

Brown Brothers

The walls of the houses are mud brick. Their roofs are made of bamboo rafters, thatched with rice and barley straw. The one window is covered with crossed strips of bamboo, on which glazed paper is pasted. The stove is of mud brick. Straw mattresses on the earth floor serve as beds. There are two or three pieces of bamboo furniture, including a low table around which family and friends can sit on the earth floor.

At dawn, Foo's mother was up. She got the breakfast—a little warmed-over rice, a barley cake, and tea. Then, all set out along the path to the farm. The father went first, then the mother with Foo's younger brother and sister. Foo stopped to get the water buffalo from the shed. He led it at the end of the line. The buffalo was cross this morning. A low rumble came from deep in its throat.

American President Lines

At the foot of towering Victoria Peak are Hong Kong Harbor and Kowloon.

"Take it to the ditch, son," ordered his father. "It will work better when we need it."

Foo turned aside toward the irrigation ditch, and the buffalo quickened its step, knowing what was to come. Water buffaloes get very cross in hot weather unless they can bathe in water or wallow in mud at frequent intervals. Now, on reaching the ditch, the buffalo slipped down the bank into the water. It settled down until only part of its head was above the surface.

Sure that the buffalo would not run away, Foo went farther up the stream. He had a small homemade fishhook and a piece of cord. Perhaps he could catch a fish. He caught a grasshopper for bait and began fishing. Nothing happened until just before Foo had to get the buffalo. Then came a tug and, to the boy's delight, a young carp was soon flopping on the bank. It was only a little fish, but Foo knew his mother would make a tasty meal of it, with rice, a bit of barley, and a handful of wild greens he had gathered along the ditch.

After some urging, the buffalo came out of the water. It was good-natured now, and willingly followed its young master to the farm fields. There, everyone was at work. It was rice-harvest time. The water had been drained from the rice fields. These were small fields, separated by narrow earth embankments. Foo's father was cutting the grain, a handful at a time. He used a curved knife, called a *sickle*. His wife gathered the stalks into small bundles which she set on the path to dry in the sun. The two younger children were pulling weeds in a small terrace vegetable garden, which Mr. Yen had built over a rock ledge.

A neighbor was waiting to take the buffalo and plow up the rice fields already harvested. There, wheat would be planted. The neighbor would receive no pay, but later Mr. Yen would help him on his own farm.

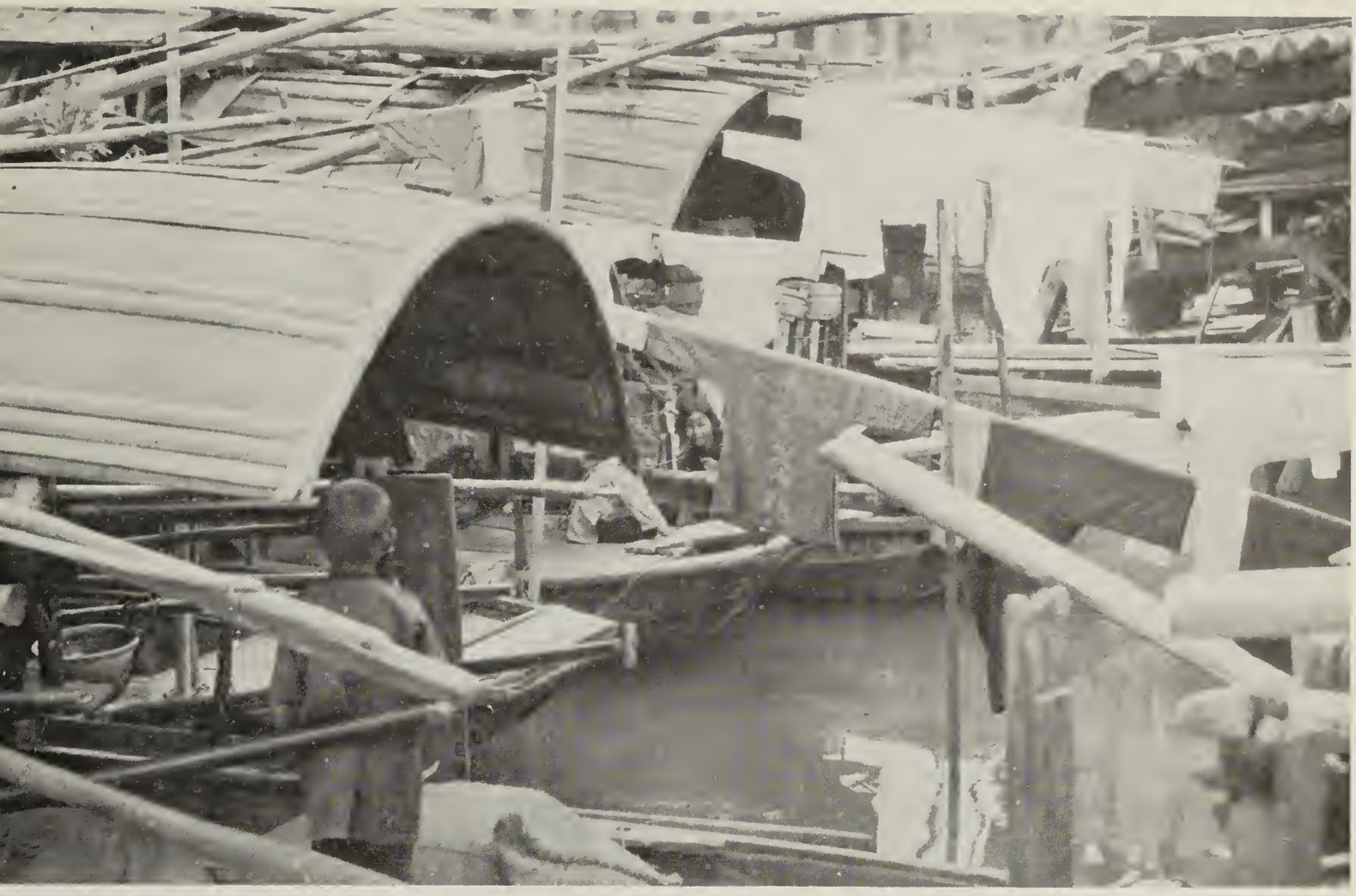
"You have done well, son," said Foo's father when he saw the fish. "Now weed the soybeans."

Beyond the rice fields, there were growing rich crops of soybeans and sweet potatoes. As Foo pulled the weeds and piled them up to rot, so that later they could be used to fertilize the soil, he thought that the earth had been good to them. There had been no drought, so there would be food enough to eat all winter and to pay taxes. Perhaps there would be something to sell, so they could buy cloth for clothes and the few other things they needed.

When the sun was overhead, he joined the family for a lunch of rice cakes. The cut rice bunches were now many. They would be carried to the village. On rainy days, he and his father would beat them over a box with slats on top. The grain would fall into the box. Some of the straw would be used to put a new thatch on the roof, for protection against the winter storms.

Late in the afternoon, work stopped and all went to bathe in the big irrigation ditch. When they reached home, his mother prepared a meal of fish, rice, greens, and squash. After that, Foo watched the little children play with toy kites. It made him think of the last kite festival, when he and his father had joined other villagers in flying kites. The air had been full of them—kites of all

Water buffaloes need to wallow or bathe in the streams frequently, or they get cross and refuse to work.



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Thousands of sampans line Shanghai's shore. Each is the home of a family.

kinds and sizes, many in the shapes of birds and animals and dragons.

"Shall we go again to the city this year, Father?" asked Foo.

"I'm afraid not," replied his father. "But you can think back and enjoy again all you saw."

Indeed, Foo could remember that trip down the great river to the wonderful city of Shanghai at its mouth. They had sailed in a sampan through the irrigation ditch to a canal, and through the canal to a river town. The sampan is a small boat with a curved mat cover at the back for a shelter. It is moved by long poles which are thrust against the stream bottom. A larger boat, used on the river, has a crew of several men to push on longer poles. Each of these boats also had a single mast and a square sail.

It had been a long trip down the muddy-colored stream, but interesting all the way. Shanghai, however, was a wholly new and wonderful world to the little country boy. First of all were the thousands and thousands of sampans along the shore. There were many boats, one tied to another. Each was the home of a family. Many people live in these boats all their lives, because living is cheap, and there is not land enough and shelter enough for them ashore. On some sampans were tame birds, called cormorants. They were dark, long-necked water birds which could dive and catch fish. Each had a ring about its neck, so that it could not swallow the fish which it had been trained to bring to its owner.

Foo stood spellbound, staring about, when his father took him into the part of the city where people from Europe and America and rich Chinese merchants lived. Here were great wide avenues, well-kept parks, and fine, tall stone and brick buildings such as you can see in the great cities of America.

Along the river front, Foo had his first view of great steamers, and of airplanes roaring overhead. In the river, too, were many *junks.* These are large Chinese sailing ships. They have two or more masts and several sails.

In many ways, the great Chinese section of the city interested Foo as much as the foreign section. Here, the streets were so narrow that store signs and banners strung on poles seemed to meet overhead. The streets were crowded with people, so that it was hard to move along. Of course, no automobiles could get through. Even the two-wheeled rickshaws and the sedan chairs, resting on poles carried on men's shoulders, had their troubles.

The shop fronts were richly carved. The ornaments were often gilded. Many of the shops had open fronts. There was a street of *goldsmiths*—or workers in gold. Here, men were making beautiful pieces of jewelry. Elsewhere, men were working with silver and copper and ivory and leather. In other shops were rich silks and satins. There were many restaurants and candy shops and stores where strange medicines and drugs were sold. There were other narrow streets where families dwelt, and where there were no shops. They seemed just as crowded.

Foo had not believed that there were so many people in the world as he saw in this one city. But his father had told him there were other great cities in China, like Hankow, six hundred miles up the river. Canton is at the mouth of the Si River (West River) in the south; and the beautiful city of Peiping, the capital of China, was far to the north.

Large tame birds, called cormorants, dive and bring fish to their masters.

Ewing Galloway, N. Y.

American President Lines

Colorful Chinese junks, sampans, and freighters crowd the harbor of the British Crown Colony of Hong Kong on the Chinese coast.

Chinese Education. When winter came again, Foo would go to school, because there was an old man in the village who could do a little teaching. Foo would learn a few writing signs that stood for words. He would be taught a few of the wise sayings of the Chinese. But he would not learn as much about his own great country, as you learn about your land. Even at that, he would learn more than many, many village children. Only a few Chinese have any chance for a real education.

For thousands of years, these Chinese students have studied mainly the writings of Confucius. He was a wise man who lived about 500 years before Christ. Many of his writings tell how he thought men should live and act. The Chinese felt that all they needed to study was found in these writings and in the writings of a few other early Chinese. They were not interested in what the rest of the world was learning.

Until 1958 the Chinese did not have an alphabet. They used a different sign, or

mark, for each word. The mark for each word had to be learned separately. Because of this difficulty many Chinese have not learned to read and write. In 1958, however, the Latin alphabet was adopted. Now Chinese children are being taught to read and write the same kind of letters that we use.

Years ago, China began educating some of her young people in a new way. Every year, she sent many Chinese students to the United States, and to other countries, to study in their schools and colleges. After completing their studies, these students returned to China to teach, and to tell of life in other nations. China also started modern schools, but war within the country prevented the growth of these schools.

When the Japanese attacked China during World War II, many of the Chinese people learned about things concerning which they had known very little before. They saw many airplanes, tanks, and motor trucks. They had to build factories to supply war materials for the Chinese armies. They came to know soldiers and other people from many different lands.

After World War II was over, the Chinese people had to keep right on fighting. A group of people fought against the leaders of the country and drove them out of power. A new kind of government was set up. Chinese

Great steamers, airplanes, sampans, and crowds of people make Shanghai's harbors busy places.

Ewing Galloway, N. Y.

armies were sent into the neighboring country of Korea to help overthrow its government. This meant more years of fighting for the Chinese people.

The Japanese war and later warfare did great damage to China and brought death and suffering to large numbers of her people, but it did teach the Chinese to be a little more like the people of other nations. The Chinese are a great people and in time they will probably become a stronger and better nation.

QUIZ QUESTIONS

1. Where is China? In what direction does China lie from our country? From the Netherlands?
2. Tell how the Chinese shut themselves away from other countries.
3. Tell briefly about Chinese methods of travel on land and water.
4. How are goods carried in China?
5. Name three things the Chinese did before other people.
6. How has the life of the Chinese been affected by their being shut away from the world?
7. Describe the Chinese people.
8. Name two great rivers of China. How have they added to the lowlands of China?
9. Tell how the Chinese make use of the river water.
10. Why is labor cheap in China?
11. Tell how the Chinese make use of mountain slopes and rocky ledges for farming.
12. Why do they raise so few cows and sheep? What animals do they raise?
13. Name five main crops grown in China.
14. Tell how tea is raised.
15. What is bamboo? Name four uses to which it is put.
16. Tell where the farmers live. Of what materials are their houses built?
17. Tell about the river dwellers of China.
18. Name four cities of China. Which is a former capital city?
19. Which cities are at the mouths of great rivers?
20. Who was Confucius?
21. Tell three facts about Chinese writing.
22. Why does China send young people to other lands to be educated?

A MAP EXERCISE

1. Locate China
2. Trace three different sea routes to China from the United States.
3. Locate the Hwang and the Yangtze rivers.

CAN YOU TELL ABOUT

1. Life in a farm village in China?
2. Travel in China?
3. River life in China?
4. Life in a Chinese City?

Richard Harrington from Black Star

Beech Aircraft Corp.

Snowtraveler Corp.

Although the dog team is a common means of travel in the snow-covered regions of the world, the skiplane and the snowtraveler are also used.

H. Armstrong Roberts

These friendly penguins have few companions in the cold expanses of the Antarctic regions.

Unit XV

COLD LANDS OF THE WORLD

You began your study of lands around the world with the hot, moist region of the Amazon Valley. It lies across the Equator where the hot rays of the sun beat down from almost directly overhead throughout the year. Gradually, you learned about other regions farther north or south of the Equator. These lie mainly in the cooler Temperate Belts, where the sun is never directly overhead. Most of the regions you studied lie north of the Equator rather than south of it. If you look at the globe, you see a reason for this. Spin the globe slowly. Look down first at the North Pole, then at the South Pole. You will see that there is far, far more land north of the Equator than south of it.

Ice Caps of the World. If you continued northward from the Equator, you would finally come to the North Frigid Zone. It is separated from the North Temperate Zone by an imaginary circle, the Arctic Circle. Within this circle, the low, slanting rays of the sun light the earth for only a part of each year. Your globe will show you a similar circle, the Antarctic Circle, around the South Frigid Zone. In this region, too, there is darkness for part of the year.

Map of the Arctic Region

Map of Antarctica

These maps show the land and water area around the poles. They also show the paths followed by explorers of the polar regions.

Would you expect regions in the Arctic Circle to be colder than regions you have studied? Of course you would. In fact, they are regions of bitter cold, of frozen rivers and seas, of land on which no trees grow. Here everything is buried under snow and ice for much of the year. This icy covering and a similar one within the Antarctic Circle around the South Pole are known as the ice caps of the world.

The Arctic and the Antarctic Regions. The Arctic Region, within the Arctic Circle, has the North Pole at its center, the most northern point of the earth. The Antarctic Region, within the Antarctic Circle, has the South Pole at its center. Both are very large regions. Using the globe, compare their size with that of our own land.

You would expect these two regions to be much alike. It is true that both are buried under ice caps. It is true that even the surfaces of the oceans are often frozen over. It is true that each receives the same amount of heat from the sun. Yet, in many ways, the two regions are very different.

If you look at the globe, you will see that there is no land at the North Pole. Indeed, there is no land for 400 miles in any direction from it. What land there is within the Arctic Circle is around the rim of the circle. Yet in this land, many groups of people dwell. There are many varieties of land animals and sea creatures. Millions of birds fly north from warmer lands to nest and raise their young during the brief summer season. During that brief season, the snow melts off the lowlands and hundreds of varieties of plants spring up and bloom in bright colors.

Now find the Antarctic Circle. Instead of open water, you discover an immense land area around the South Pole. This

is the continent of Antarctica. It is surrounded by three oceans, but there is comparatively little water within the Circle. Most of the land consists of high plateaus and mountains. Some are more than two miles above sea level. You know how the air grows cooler as one climbs a mountain. So you see that the Antarctic regions must be cooler than the Arctic regions. Moreover, the storms at higher levels are more severe.

You see no animals on these cold lands and few birds except the Arctic tern and the tall penguins. At a little distance, the penguins look strangely like people as they waddle along or gather in groups. But no people live on these cold shores, and there are no lowlands where flowers can spring up and bloom.

Glaciers and Icebergs. Where the land slopes to the sea in both Polar regions, glaciers move slowly down the hills. At the ocean, the glacier ice breaks off in enormous masses. Many of them are a mile or more in length. These icebergs, as they are called, often tower hundreds of feet in the air, and the part which is under the water is seven or more times as great as that above it.

As they float along in the sea, the icebergs shine brightly in the sunlight, varying in color from white to blue. Some run aground in shallow water. Others drift off to warmer climates where, until they finally melt away, they are a great danger to ships. You remember the iceberg that Mark saw off the Newfoundland Banks. That probably came from the Arctic Ocean.

The Sun in the Far North. You have already seen that summer and winter in the Far North are very different from summer and winter in our land. Within the Arctic Circle, the winters are very long and the summers very short. Every winter there is a period of darkness during which the sun does not rise at all. Every summer, there is a period during which the sun never sets.

The farther north one goes, the longer are these periods of darkness and light. Along the fringe of land around the Arctic Ocean, these periods of darkness and light may be two or three months long. At the North Pole, there are six months of darkness followed by six months of light. Even during the periods of light, the sun never gets high in the sky.

The Arctic Seasons. The Arctic winter is bitterly cold, and the storms are very severe. You must not think, however, that the period of winter darkness is always absolutely dark. In the clear air of the North, the stars are very bright, and their light, reflected from the snow, helps one to see his way about. Then there are the periods of moonlight. In addition, shimmering lights appear in the sky at frequent intervals. These are the northern lights that we see more faintly, now and then, on clear, cool fall or winter nights in our country.

While the summer sun never rises very high above the horizon in the Arctic region, what a change it brings about! Though it does not give heat enough to melt all the snow and ice, it makes the air surprisingly warm. Some of the ice that covers the ocean melts, and also much of the snow and ice along the shores. Patches of bare ground appear that have been buried deep under snow all winter long.

Then wonderful things happen! Many coarse grasses and ferns spring up. Many low-growing plants send out leaves.

Richard Gingher

The short Arctic summer brings flowers and open water to the region.

Hundreds of kinds of bright-colored flowers bloom, including poppies and pink and white dandelions. From flower to flower buzz great bumblebees, and caterpillars crawl over the leaves. Butterflies and moths flutter about. Many little plants grow in the water, and many tiny water animals are seen. On these, birds, fish, seals, and other animals feed. Even mosquitoes and flies are seen in summer in Eskimo Land, and are a great nuisance to both men and animals.

Birds of the Arctic. Many birds fly north during the summer and add their songs to those of the birds which live in this region all through the year. You see the snow bunting, a relative of our English sparrow; the ptarmigan, a bird which looks like our quail; the owl; the great black raven; and the plover. There are sea birds, too,—the eider duck; the auk, a bird whose flesh is used for food by the natives; the tiny dovekie; and the Arctic tern that lives in Antarctica and comes to the Arctic to nest, a round trip of 20,000 miles.

Animals of the Arctic. There are a surprising number of animals in the Arctic regions. This is a good thing, for the natives depend largely on animals for food, clothing, light and heat, and partly for shelter. Most important of all the animals is probably the hair seal. It can be hunted summer and winter. The walrus, another sea animal, is much larger than the seal. It may weigh 3000 pounds and is a savage animal when hunted. A sea and land animal is the polar bear. This bear can travel rapidly

Richard Gingher

These Alaskan Indians are preparing moose meat to be stored until winter when hunting is difficult.

on land, can swim long distances in the icy waters, and is always dangerous.

Among grazing animals are the reindeer and the musk ox. In summer, they live on the green grass and moss. In winter, they paw away the snow to get at the dried grass. The musk ox is somewhat smaller than the ordinary ox. Rabbits are common in the Arctic but are hard to see. In winter, they are white like the snow; in summer, they are brown, the color of the rocks among which they live. Among other animals are ermines, foxes, and wolves which change the color of their furs in winter.

People of the North Polar Lands. In the cold lands of the Arctic regions dwell a number of peoples. Along the shores of North America are tribes of American Indians. Also, there are the interesting groups of Eskimos who dwell along the coast of the great island of Greenland.

The Eskimos are, usually, rather short and fat. When dressed in their winter furs, they look very fat indeed. Their faces are wide and rounded. Their eyes are slanted and their noses flat. Their complexion is light brown and their hair is straight and jet black.

You would like the Eskimo people, once you came to know them. They are friendly, good tempered, and full of fun. They are fond of sports and games. In their struggle for food and other necessities of life, they show courage, patience, and ability to work hard.

Publishers Photo Service

Eskimos wait at blowholes for seals to come up for air.

The Story of Ootah and His Family. In order to become better acquainted with these people, suppose we visit Ootah and his family.

The Long Night. Papek had been watching his father, Ootah, for a long time. He knew it was a long time, for the moon had moved quite a distance in its circle around the sky since his father had chopped a hole in the sea ice. Since then, he had been standing motionless beside it, one arm raised. He was waiting for a seal to come up to breathe. In his hand was his harpoon, pointing downward into the water. His harpoon was a long pole with an ivory point, made from a walrus tusk, to which a leather rope was fastened.

Ootah made quite a figure as he stood there. His long coat was made of foxskin. Attached to the coat was a fur cap that could be drawn over his head. The trousers were of bearskin. The boots were of sealskin, from which the hair had been scraped. The socks were of rabbit-skin with the fur inside. Under the coat was a shirt of thin skins. On his hands were long, thick fur gloves. Papek, dressed just like him, looked like a small image of his father.

The northern lights blazed up with a display of red and yellow beams of shimmering light. Little fingers of deeper red danced in front of the beams. The dogs attached to the sled nearby stirred uneasily. Papek looked at them sharply and fingered his long leather whip. If the dogs knew they were watched, they would behave themselves. Otherwise they might eat their leather harness or quarrel among themselves.

Suddenly, Papek saw his father stiffen. The harpoon flashed downward. Water sprayed out of the hole. Ootah gripped the rope firmly. After a struggle, a big seal was hauled onto the ice, and killed at one blow.

Papek and his father were happy. This and a smaller seal made good hunting. The seals meant food and clothing, and oil for light and heat. Even the dogs

jumped up and barked. They knew this meant more food for them.

Papek drove the dog team with the sled up to the seals, so that they could be loaded. The dog sled was long and narrow. Its runners were made of driftwood and the pieces connecting them were made of ivory. The sled had a backrest on it. Each dog of the team was fastened by a simple harness to a rope. The rope was connected to the front of the sled. Ootah guided the team by shouts and by his whip.

On his trip homeward, Papek rode on the sled. His father ran behind it with one hand upon the back. Neither minded the cold, although the temperature was many degrees below zero. Their fur suits kept them warm. The dogs traveled fast, and it was not long before the snow-covered huts of the tiny village showed ahead. There was one hut for each family.

Papek and his father stopped before the entrance of their home. It was a little rounded house built of sod and stone. They entered by creeping through a long, low tunnel, covered by skins at the inner end to keep out the cold. Halfway down, the tunnel widened to form a small hall. Here, Ootah tied up the dogs, took off their harness, and hung it where the dogs could not reach it. Papek pushed aside the skins and stepped into the family room to greet his mother. She, too, was dressed in sealskins and foxskins.

There was a long, low platform at the back of the room, covered with loose furs. On it, under the furs, his sister, Evalso, was sleeping. They all slept on this platform, lying down when they felt sleepy. It was hard to keep regular sleeping hours during a night that was months long. The platform was the only real furniture, except for a stone base on which stood the lamp, that gave both light and heat. The lamp was cut from a piece of soapstone and shaped like a bowl. The bowl was partly filled with seal fat. Twisted strands of moss formed the wick.

Ootah came in, dragging the small seal. The larger one he had buried under snow and ice outside. "We have had good hunting," he told his wife. "Suppose we ask Nuka and his family to come over for a meal. Nuka has done no hunting since he injured his leg." At his wife's nod, he added, "Go, Papek. Ask them over."

Soon Papek was back, followed by the guests. The two women rubbed noses by way of greeting. Papek's mother admired the baby which the other woman carried in a fur pocket on the back of her coat. Nuka's other children joined Papek and Evalso.

Ootah had quickly skinned the seal, and now the two families sat down around him. He cut strips of flesh and passed them out. Nobody minded that the meat was raw. They liked it that way. They ate until they could eat no more. Then the men told jokes and tales of dangerous hunting. Papek's mother told of the trader they had met on a long journey, and how she had traded furs for an iron pot.

Had there been more guests, they might have played simple games or gone outdoors and danced. Meanwhile the children romped about or played with Papek's toys.

The long night passed slowly for Papek. Now and then, he and his father went hunting, but it was a winter of dangerous storms. They did not have much

Harold W. Johnson, for Alaska Division of Tourist and Economic Development

Clothing made of fur-lined skins keeps this Eskimo warm as she fishes through a hole chopped in the ice.

success. When the blizzards raged, Papek watched his mother rub and rub the sealskins or sew together skins for a new coat. She used ivory needles his father carved. He watched his sister, Evalso, as she made a little birdskin shirt. She worked very slowly and carefully, trying to make each stitch perfect.

When his father worked for days, carving a new hunting knife, Papek carved a small one for himself. He also helped to build a new kayak and repair the family umiak.

A kayak is a man's hunting boat which holds only one person. It is made of sealskin stretched completely over a frame of whalebone. The hunter sits in a round opening in the sealskin top. A sealskin "cuff" around the opening is laced tightly around the man's body. Even if the boat tips over, as it often does, it remains watertight. The hunter is skilled in swinging the boat upright again. Umiaks are larger, open boats, used by a family. They hold five or six people. They, too, are made of skins stretched over a framework of bone.

Once, when the worst of the winter seemed over, the whole family set off on the sled to visit Ootah's brother. He lived an ordinary half-day's journey away. The moon was shining brightly when they started, and the wind was light. But, a few hours later, the moon became hidden by clouds, the winds rose swiftly, and with little warning a blinding snowstorm struck. Thinking it might be just a squall, Ootah kept on. But the

gale did not stop. Drifts formed and the dogs grew unwilling to go on. They wished to curl up in the snow and let the drifts cover them.

Presently, Ootah stopped on a wind-swept spot. He whipped out his hunting knife and began cutting and shaping blocks of hardened snow and ice. His wife took these and began to lay out the rounded wall of the snow igloo. The children helped. Layer by layer it rose, curving inward towards the top. Ootah knew just how to shape the blocks, for he had made many such igloos for shelter on long hunting trips. It was surprising how fast the work went. Soon they were inside with their provisions, while the dogs crowded into the short tunnel.

But the storm did not stop. It continued to rage with fury. "It may last for days," Ootah said. They were short of food—for themselves and for the dogs.

As the dogs grew hungry, they became more savage. He turned them out to bury themselves under the snow, fearing they would attack the children.

Suddenly, many hours later, the dogs began barking savagely. Ootah wished he had exchanged many skins for a rifle last summer. He seized his spear and harpoon and made for the entrance. "Game!" he cried, motioning Papek to stay behind.

Outside, he freed two of his best fighting dogs. They dashed into the driving snow. Almost at once, one yelped in pain. The other snarled fiercely. It was answered by deep growls. Presently Ootah made out the dim figure of a bear. It stood on its hind legs. With a

The bear tossed the dog aside with a sweep of his great paw.

Keystone View Company

An igloo for shelter on a trip is built from blocks of snow.

sweep of its powerful paw, it had put one dog out of action. Now, at sight of Ootah, it charged. Ootah flung his harpoon and jumped. Claws ripped his coat. But the other dog rushed in, and Ootah got away. It was a long struggle, but at last there was a chance to use the spear. The fight was over and the needed food was obtained.

Ootah carried the wounded dog to the igloo to be treated. Then with the dog team, he dragged in the bear. All feasted well. Later, Ootah's wife went to work on the torn coat. When the storm was at last over, they struggled through the drifts to the brother's igloo. What stories they had to tell about the trip!

The Long Day. Late in the long night, Ootah pointed out a faint glow along the horizon. "The sun is on its way back," he said. Very slowly, the glow reached higher. At last, Ootah agreed with the other village men that the sun was about due.

All the people poured out of the igloos to watch its return. Suddenly a beam of bright light shone in their eyes, and a band of light spread across the snow. The men pulled off their coats and shirts, in spite of the cold, and raised their arms in greeting to the sun. They believe that if they greet the sun in this way they will be sure to live to greet the sun the follow-

ing year. Though the sun disappeared quickly, the people rejoiced over its coming.

Each day the sun shone a little longer, but it was weeks before the days were long. At last, the days equalled the nights. Then they grew longer than the nights. The air became warmer. At last, snow began to melt. Sharp reports sounded from the sea as its icy coating broke and wide cracks appeared. Birds began coming north in great flocks. Summer was back. Grass and moss grew rapidly and flowers bloomed on the lowlands.

Now began busy times for the Eskimos. It was time to gather food and skins for the next long winter. The families deserted their stone and sod igloos and began living in tents. The tents were made of skins stretched over poles. The families moved to where hunting was good. Papek watched his father and other men, some in kayaks and some on land, fight a savage walrus. Others hunted the seal, the reindeer, and the musk ox. The meat was divided among the hunters and was packed away in snow and ice, and often covered with stones. Thus no animals would get it. In the winter, the meat would be brought home for use.

Even the children were busy. Like many of the others, Papek fished along the shore. At other times, he hunted for the nests of certain birds whose eggs were good. Great quantities of eggs were gathered and were packed away and frozen. With his bow and arrow, he hunted birds for a new birdskin shirt. He tried hunting rabbits, but they were too wise for him. So he tried trapping them. He built tiny igloos with doors that would drop when a rabbit went in to get the

The hunters left their Kayaks and pulled the bear onto the ice.

Ewing Galloway, N. Y.

Brown Brothers

The musk ox, neither friendly nor beautiful, will charge upon sight.

bait he had placed inside. With these traps, he was more successful.

Once, while visiting his traps, Papek came upon a musk ox. The beast charged him, and the boy ran for his life, yelling for help. He stumbled on the rough ground and fell. The ox came on, but just then the leader of his father's dog team came rushing to his aid. Cleverly he dashed at the ox and persuaded the ox to chase him. While Papek got to his feet and scampered to safety, the dog led the ox away. Papek saw to it that the dog had an extra good meal when he came back.

But the long day of hard work ended. The sun went out of sight for a short time. Slowly the nights grew longer. Many of the birds had left. The cold came back and the people headed again for their winter igloos. But everyone was happy. They had food enough to last through the long night.

Explorers of the Polar Lands. Probably you are wondering how we have come to know so much about the Eskimos, who are shut away from the rest of the world. No railroads run to their country, and no steamship lines send steamers back and forth. Now and then, a plane flies across the polar sea, but does not land. Some Eskimo families live far enough south to be in touch with white people, but many have never seen them. What

we know of the Arctic and Antarctic regions we have learned largely from a few brave men of our own and other countries who have faced the perils of those far-off places.

Again and again, people have tried to cross the Arctic Ocean, in the hope of finding a northern passage for ships from the Atlantic to the Pacific. Time after time, explorers have gone into the Arctic lands, often trying to reach the North Pole itself. Many died from cold or lack of food. Others had their ships crushed by the ice. A few have come back to tell us of their discoveries and experiences.

One explorer, named Stefansson, lived for months on the ice of the Arctic Seas, shooting seals to keep himself and his dogs alive. Part of the time, he lived with Eskimos who had never seen a white man before. Another explorer, MacMillan, sailed far north until his ship was caught in the ice and frozen there for the entire winter.

Discovery of the North Pole. Although for many, many years men had tried to reach the North Pole, Admiral Peary, of our own United States Navy, was the first man to do so. For twenty-five years he had tried, and at last he succeeded.

Many explorers failed when their ships were crushed by the ice. Here the "Bear," a famous Arctic ship, is caught in the ice.

Ewing Galloway, N. Y.

In the summer of 1908, Peary sailed from New York on the *Roosevelt,* a ship specially built to withstand the crushing ice. He knew he had a long hard trip, so he took plenty of food, clothing, and equipment with him. Besides the common food supplies, he took a large quantity of pemmican, a nourishing food much used in the Arctic regions. It is made of dried meat mixed with meat fats and raisins. He did not take fresh meat, for he knew he could get plenty of it in the northern lands.

Peary also took wood, from which his Eskimo helpers would make sleds and whips and lances. He carried a supply of matches, needles, thread, rifles, knives, and other things the Eskimos like, to pay them for their work.

Peary sailed north along the Atlantic Coast as far as Baffin Bay. See the map on page 224. In this region, he took on board several Eskimo families with their dogs and drivers to help him. Sailing northward, he entered the Arctic Ocean at Cape Sheridan. There he had to spend the winter as his ship was frozen in the ice.

During the long winter, the Eskimo men killed game for meat, and made sleds and dog harnesses and other things needed. The women sewed clothes of fur for their own families and for Peary's men.

On February 15, 1909, about a week before the sun would appear, the men, with their dog teams, started for the North Pole in six groups. When they turned north over the frozen Arctic Ocean, it was hard going. Often they came to a wide space of open water. They had to go long distances around, or wait for the water to freeze. One by one, the groups were sent back as the food supply became low. Finally, only one group was left. It consisted of Peary, a Negro named Henson, and four Eskimos. On April 6, they reached the North Pole. It had taken them 36 days from Cape Columbia. They stayed there 30 hours. All that time the sun seemed to go round the sky at the same height above the horizon. This showed them that they were at the most northern part of the earth.

Peary's party then started back for Cape Columbia, reaching it in sixteen days. Soon they were on their ship once more. But a long, long time passed before the vessel could get free from the ice. There was no radio in those days. Months passed before Peary could send a message to tell of his discovery.

To the North Pole by Airship. Others have since reached the North Pole, but in different ways. In 1926, Commander Byrd, also of our Navy, flew an airplane from the island of Spitzbergen, straight to the pole and back again. The island of Spitzbergen is far north of Norway, a country of Europe. In the same year, Amundsen flew from Spitzbergen across the North Pole in a great airship, called the *Norge.* Having crossed the pole, he kept right on, and finally landed in Alaska. In 1952, another aviator flew from Spitzbergen across the North Pole to Alaska. His whole trip took only 10½ hours! In 1958, a nuclear-powered submarine, the *Nautilus,* made the first underwater trip to the North Pole. Modern means of travel have enabled us to learn much about the Far North.

Discovery of the South Pole. Because of the great desolate land area in the Antarctic region, few attempts have been made to reach the South Pole.

In 1910, however, two exploring parties set out for the South Pole. One sailed from England, and was commanded by Scott. The other started from Norway, and was headed by Amundsen. In January, 1911, the two parties landed at points 400 miles apart. It took each party months to explore the region nearby, and to make preparations to reach the pole during the Antarctic summer, which comes in December and January.

In October, Amundsen started with four companions and four sleds drawn by dogs. It took them fifty-two days to reach the South Pole, a distance of 864 miles. Here they set up the flag of Amundsen's country, Norway. Amundsen left a letter addressed to the king of Norway for the next comer to carry back as proof that they had reached the pole.

Scott's party reached the South Pole five weeks later and found Amundsen's letter. But they never left Antarctica alive. Later, a searching party found their bodies and a written record of their hardships.

Philip Gendreau, N. Y.

Why must Antarctic expeditions take so many supplies with them?

In 1929 and 1947, Admiral Richard E. Byrd flew an airplane over the South Pole. Admiral Byrd led several expeditions to Antarctica. Since then, several expeditions have reached the South Pole by land, including those of Dufek, Hillary, and Fuchs during the International Geophysical year.

QUIZ QUESTIONS

1. Point to the North Pole. To the South Pole. Locate the poles on the globe.
2. Where is the Arctic Circle? The Antarctic Circle?
3. What names are given to the area within the Arctic Circle? To the area within the Antarctic Circle?
4. What is meant by "ice caps of the world"?

5. How is the Arctic Region different from the Antarctic Region?
6. What are glaciers?
7. What are icebergs? Why are they sometimes dangerous to man?
8. Tell about the sun in the Far North.
9. Tell about the Arctic winter.
10. Describe the Arctic summer.
11. Name at least four birds found in the Arctic region.
12. Name at least five land and sea animals found in the Arctic regions.
13. Describe the Eskimos.
14. How are seals captured by the Eskimos in winter?
15. Describe an Eskimo's clothing.
16. Tell about the northern lights.
17. Describe the winter igloo, inside and out.
18. What three kinds of houses are used by an Eskimo family during the year?
19. Tell about the Eskimo dog team.
20. What weapons do the Eskimos use?
21. What is the difference between a kayak and a umiak?
22. When the sun returns, what is the main occupation of the Eskimo people?
23. How do the people preserve food caught or gathered in the summer?
24. Would you rather visit Eskimo Land in summer, or in winter? Why?
25. Tell about Peary's trip to the North Pole.
26. In what other ways was the North Pole reached? By whom?
27. Name three explorers who reached the South Pole.

YOU CAN VISIT

1. A museum where you can see Eskimo clothing, a dog sled and dog-team harness, a kayak, and an umiak.
2. A zoo, where you can see polar bears, seals, Arctic foxes, Arctic wolves, ptarmigan, eider ducks, and other Arctic animals and birds.
3. A natural history museum where you may see stuffed animals and birds of the Arctic Region, and models of igloos, kayaks, and umiaks.

If you cannot visit these places, or even if you can, it will be fun to make a museum exhibit to show your friends.

Courtesy of the Matson Lines

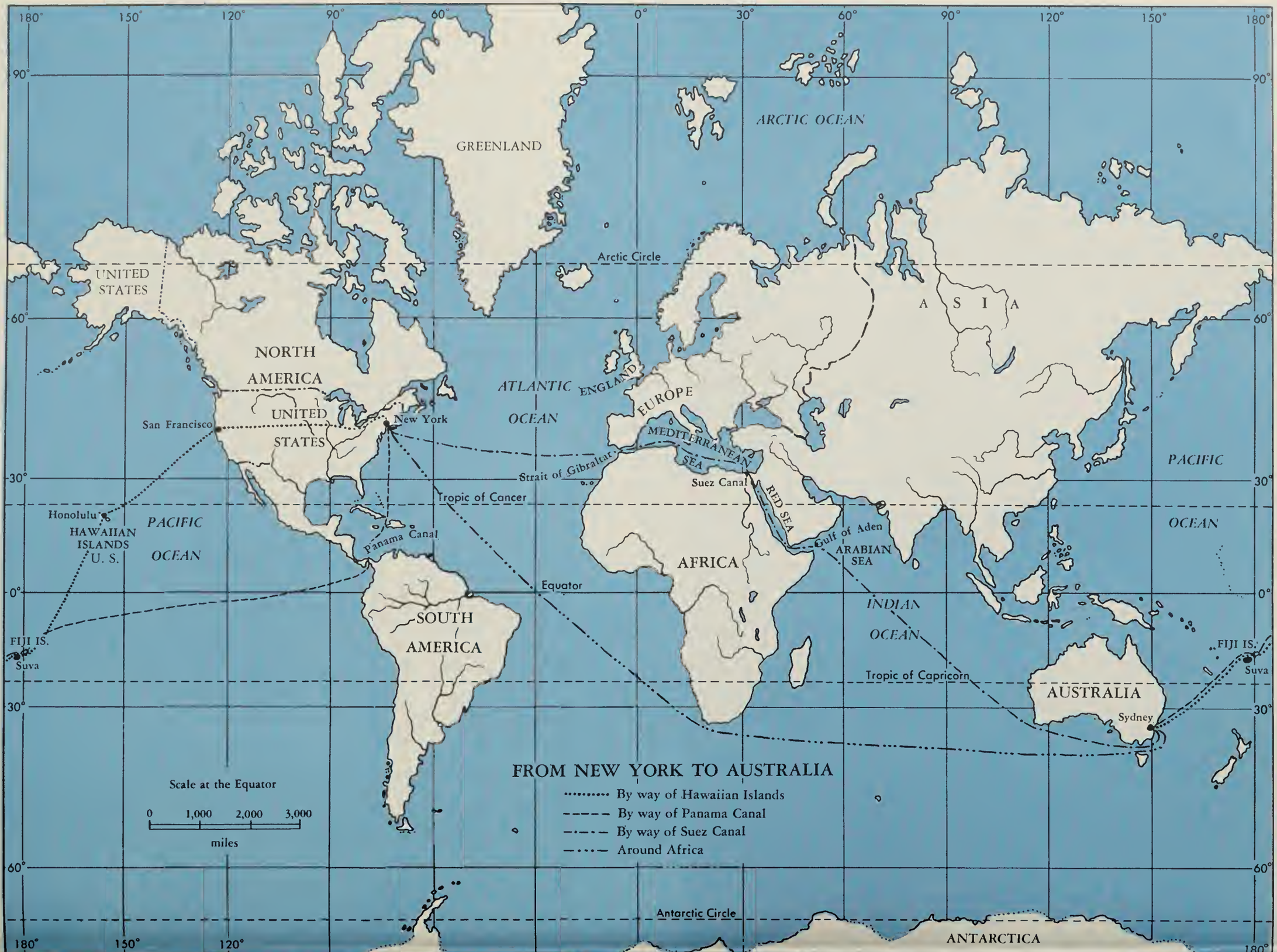
Our Pacific liner travels 2400 miles from San Francisco to Honolulu.

Unit XVI

AUSTRALIA, THE ISLAND CONTINENT

You have been studying, one by one, regions of many kinds—hot, wet, dry, temperate, cold. It will be interesting to see how a continent is made up of a number of these regions. For this purpose, suppose we visit the island continent of Australia, far across the Pacific Ocean. Look at the map or globe and locate Australia. Why do you think it is called the Island Continent?

How to Reach Australia. You remember the different ways in which you can travel to China. In the same way, you can travel east or west to reach Australia. You can even follow another sea route by sailing southeast across the Atlantic, around the southern tip of Africa, and through the Indian Ocean to Australia. The shortest routes, however, are across the Pacific from our west coast. You can reach San Francisco by fast train from any point in the United States in three days or less. You can reach it by airplane in less than a day. If you travel from San Francisco to Australia by airplane, the trip will take less than three days. If you travel by steamship, you will take about three weeks. Whether you travel by water or by air, you will make several stops on the way. Since we are not in a hurry, let us go by steamer, and enjoy a sea voyage.


180° 150° 120° 90° 60° 0° 30° 60° 90° 120° 150° 180°
90°
60°
30°
0°
GREENLAND
ARCTIC OCEAN
Arctic Circle
UNITED STATES
NORTH AMERICA
ATLANTIC OCEAN
ENGLAND
EUROPE
ASIA
San Francisco
New York
UNITED STATES
MEDITERRANEAN SEA
Strait of Gibraltar
Suez Canal
RED SEA
PACIFIC OCEAN
Tropic of Cancer
Honolulu
HAWAIIAN ISLANDS U. S.
Panama Canal
Gulf of Aden
ARABIAN SEA
AFRICA
Equator
INDIAN OCEAN
SOUTH AMERICA
FIJI IS.
Suva
Tropic of Capricorn
AUSTRALIA
Sydney
Antarctic Circle
ANTARCTICA
Scale at the Equator
0 1,000 2,000 3,000
miles
FROM NEW YORK TO AUSTRALIA
By way of Hawaiian Islands
By way of Panama Canal
By way of Suez Canal
Around Africa

Deane Dickason, from Ewing Galloway

The islands have wonderful sandy beaches, dense forests, and high volcanic mountains.

On Our Way. Though not as large as the giant liners which cross the Atlantic, your ship has several decks. There are cozy staterooms, with beds, chairs, closets, and all the comforts of a large hotel. There is a beautifully decorated hall where entertainments and meetings are held. There is a large dining room with rows and rows of tables. The decks are wide and long. Here you can walk, or play games. In one part of the ship is a large swimming pool. There is something to do every minute. How hungry you get in the salt sea air!

You sail southwest across the Pacific. Now and then, you pass a sailing vessel or another steamer. Each day you find the weather getting warmer and warmer. Finally, you sight a group of islands far ahead. These are the Hawaiian Islands, 2400 miles southwest of San Francisco. On the fifth day out, you reach them.

The Hawaiian Islands lie just south of the Tropic of Cancer. They are also washed by a warm ocean current. The weather is warm all the year round. The islands have wonderful sandy beaches, dense forests, and tall volcanic mountains. There are some live volcanoes. As you draw near the islands, you can see great fields of sugar cane and pineapples.

Your ship docks at Honolulu, the largest city in the islands. Many American flags are flying, for these beautiful islands make up our 50th State. Honolulu is a busy city. It looks much like Los Angeles or a Florida city, with modern buildings, palm trees, and bright flowers. You see people of many nations on the streets. There are Americans like

Compare the above map of Australia with Australia as it appears on your classroom globe. What does the map show that is not clearly shown on the globe? Does the globe give you any information which the map does not give?

yourselves but there are also Japanese, Chinese, Filipinos, and many others.

From Hawaii to Sydney. As you sail away, Hawaiians call "Aloha Oe," which means "Farewell!" You are sorry to leave. You would have liked to visit the pineapple fields and canneries. It would have been fun to take side trips to the wonderful tropical forests. You would have liked to sail to another of the islands for a close and stirring view of a towering, live volcano. However, the ship must sail on.

The vessel heads more nearly south now and will not stop again for over eight days. You see few ships, but now and then pass small green islands. The weather gets hotter and hotter. On the fourth day from Honolulu, you cross the Equator. After that, the weather grows slightly cooler, although you are still going south. This seems strange until you remember that south of the Equator the climate changes from hot to cold in the same way as it does north of the Equator. The climate and seasons are just the opposite of our own.

As you sailed farther and farther south, the North Star came closer and closer to the northern horizon. After you crossed the Equator it was completely out of sight. Someone points out to you, however, a group of stars to the south, called the Southern Cross. People in the southern part of the world, you learn, use these stars to find which direc-

tion is south, just as you use the North Star to know which way is north.

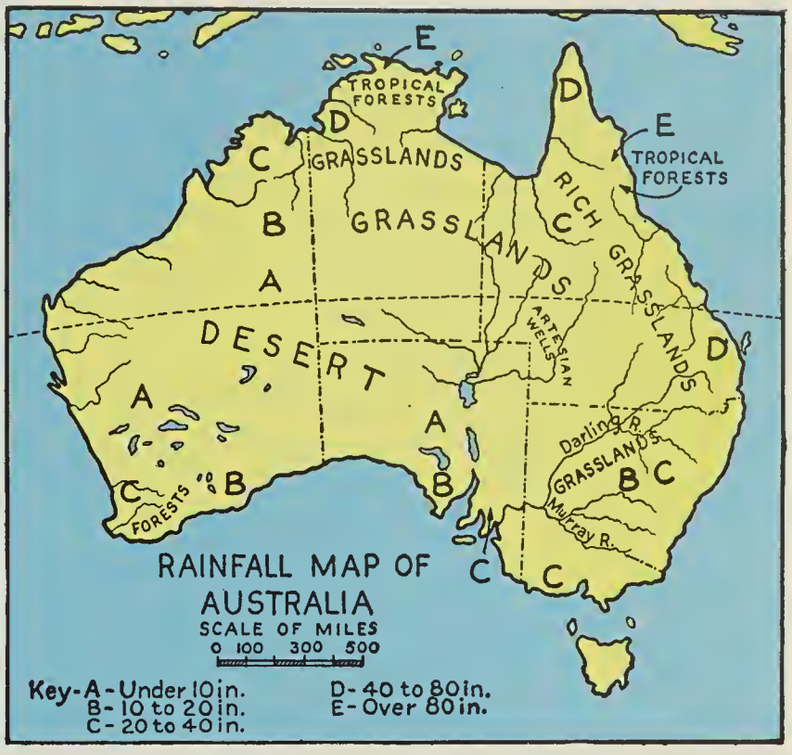
On the ninth day out from Honolulu, you arrive at Suva, the capital of the Fiji Islands. On the sixth day after leaving Suva, you enter the fine harbor of Sydney, a great seaport of Australia. You set foot on Australian soil, twenty days after leaving San Francisco.

The Size of Australia. Australia is the smallest continent. But how large is it? There are three ways of finding its greatest distance from north to south.

Look at the map. Do you see the Equator? Do you see the parallel of 10 degrees (10°) south latitude? That parallel is just a little north of Australia's northern edge. What parallel is just a little south of Australia's southern edge? Australia, then, is about 29 degrees from north to south. As a degree is nearly 70 miles, you can find this distance from north to south by multiplying 70 miles by 29. How many miles is this?

Down in the corner of the map is a scale of miles. The figures on it tell you the number of miles the scale stands for. With this scale, measure the longest distance in Australia from north to south. The longest distance from east to west.

Another way to discover whether Australia extends far from north to south is to find out what crops grow in its most northern and southern sections. Grapes, peaches, and pears grow in the southern part of Australia. These same fruits are raised in New York and other northern states of our land. Oranges, bananas, and even that hot-climate plant, sugar cane, grow in the northern part of Queensland, one of Australia's largest states. These are our southern products. All this means that Australia is about as long



Where do you find the greatest rainfall in Australia? The least rainfall?

from north to south as is the mainland United States. Australia is not such a small continent after all.

If you look at the map again, you will see that the east coast, or Pacific slope, of Australia curves so far out that it is much longer than the straight distance from north to south. The coast line is more than one fourth longer. The slope from the mountains to the sea on this eastern side looks very narrow, yet if you measure it, you will find it is two hundred miles wide at its widest point.

An interesting modern way to show how one land compares with another in size is to draw the map of one over the map of the other. Of course you must use the same scale. Look at the map on page 245, in which Australia is drawn over our own United States mainland. You can easily compare the north-south and the east-west dimensions of the two countries. Do you think the two countries are about the same size? Actually, Australia is almost as large as our homeland.

Keystone View Co. of N. Y., Inc.

High mountains line the entire cost of Australia. They form a long ridge known as the Great Dividing Range.

Mountains. There is an extensive highland region which follows the entire coast of Australia. It is rarely more than 100 miles inland. The highest mountains in Australia are in this region. They form a long ridge, known as the Great Dividing Range. Much of this great ridge is over 2000 feet high, with mountain peaks more than twice that height. The highest of all is Mount Kosciusko, about 200 miles southwest of Sydney. It towers more than 7300 feet above the level of the sea. That is higher than any mountain in our country east of the Mississippi River. Is it more than a mile high?

There are some low mountains in the central part of Australia, and also near the western coast. Most of western Australia, however, is made up of low desert plains, where there are few streams.

Study these western and central mountains on the map on page 242. The central ranges have no forests. Can you give a reason for this? Would you say there is more low land along the western coast or along the eastern coast? Notice that these ranges have an east-west direction.

Rainfall and Plant Growth. You remember how much rainfall and moisture have to do with plant growth. In your own neighborhood, you have seen how much better crops grow in the moist valleys than on the dry hillsides. You have seen plants wilt and die from lack of rain. But how fresh and green they are when there is plenty of moisture! You remember the hot, moist Amazon Basin with its dense forests, and the hot, dry Sahara

Desert where few plants grow. Let us see how rainfall and moisture affect Australia.

If you study the rainfall map of Australia, you see that on the east coast and on Cape Arnhem and Cape York the rainfall is over 40 inches a year, or about that of northeastern United States. That amount, at least, is needed to grow good forests. In certain parts of Australia, the rainfall reaches 100 inches. Here are tropical jungles like those of the Amazon Basin.

Inland from the areas of heavy rainfall and on the southeastern and southwestern coasts, the rainfall is only 20 to 40 inches. In such areas, grasses and grains grow well. Here you will find natural grasslands, like those of the upper Nile, and cultivated crops of wheat and corn.

The United States mainland overlaid on Australia.

Still farther inland, beyond the real grasslands, and on parts of the west coast, are great areas having a rainfall of only 10 to 20 inches. Some poor grass, enough to feed sheep, grows in parts of this area. The ranches, or sheep stations, are very large. The grass is so poor that it takes a great deal of land to grow enough for the sheep. In the rest of Australia, the rainfall is less than 10 inches a year, and the land is a real desert.

You will see, then, that only a small portion of Australia has heavy rainfall. Nearly two thirds of the continent has very little rain.

Floods and Droughts. Unfortunately, too, the rainfall in Australia cannot be depended upon. Sometimes, even in sections which are usually dry, rains are so heavy that the land is flooded. People have actually been drowned in the desert.

More common and as terrible, however, are the droughts in those sections where rain is counted on. Great areas of Australia sometimes have no rain at all for a whole year. Often western Australia gets very dry. There is little land where people can live. Not so very long ago, most of Australia went without rain for nearly two years.

During the great droughts, the land gets very dry. Often rivers cease to flow. Grass and farm crops wither away. Then the sheep and cattle die by the thousand

Ewing Galloway, N. Y.

A dam across this tree-lined stream will soon turn this valley into a lake to supply water for irrigation.

from lack of food and water. There is terrible suffering.

The Rivers of Australia. Rain falling on the eastern slopes of the Great Dividing Range is carried to the Pacific Ocean by streams which are short and rapid. Rain falling on the western slopes of this range forms the rivers which flow southwest or northwest. Here the slopes are more gradual and the rivers longer.

The largest river in Australia is over 1000 miles long. This is the Darling River. It rises in about the center of the Great Dividing Range. The Darling flows southwest. Before it empties into the ocean east of Spencer Gulf, it is joined by another river, the Murray, flowing up from the southeast. Together, these rivers form the Murray-Darling system, which drains a fifth of the continent.

Except in times of drought, steamboats can sail up the Darling River for more than five hundred miles from the sea. They can sail up the Murray nearly as far. Wheat, fruit, wool, and other products of southeastern Australia are sent by boat to the seaport of Adelaide near the river's mouth. At Adelaide, the goods are loaded on ocean steamships to be carried to other countries.

The Murray-Darling is the only great river system of Australia. All along the coast of the continent, except along the Great Australian Bight, there are short rivers running down to the sea. Though most of these streams are too shallow for boats, it is possible to sail up a few of them for about 100 miles.

We are used to rivers that grow larger because of other streams flowing into them. In Australia, however, some of the streams grow smaller towards their mouths. They start in regions having a fair rainfall, but flow through such hot, dry areas that the water is gradually taken up by the land and the dry air.

Strange Lakes. There are but few large lakes in Australia. Some of these are north of Spencer Gulf. Others are in the southwest desert area. The Australian lakes are broad, but shallow. In dry weather they, and the rivers flowing into them, get very low or even dry up. In times of heavy rains, they overflow and flood the surrounding country. They are very different from the mountain lakes in our own country and in Switzerland. In these lakes the water is deep and clear, and there is little change in water level, owing to regular rainfall.

Some of the Australian lakes, especially in the desert, contain salt water. A few are below sea level. Streams flow into these very low lakes, but no water flows out of them. From time to time, they dry up in the hot air of the desert.

PLANTS AND ANIMALS OF AUSTRALIA

Nowhere in the world will you find more interesting plants and animals than in the Island Continent. They include a number of creatures that are closely related to animals that lived on the earth thousands and thousands of years ago. Everywhere else these animals disappeared long ago.

Plants of Australia. Many of the trees of Australia are strange to other parts of the world. You may have seen forest land where masses of low ferns cover the ground. In the tropical forests of Australia there are deep valleys in which grow ferns with wide spreading tops and thick trunks. They look like trees of considerable height.

Another very strange tree is called the "bottle tree". This tall tree looks exactly like a giant bottle with some branches of leaves stuck in its neck. The trunk grows thick and straight and tall, and then narrows quickly to a small neck from which the branches grow.

In the dense northern forests are many palms. There are also strange grass trees whose trunks sometimes grow ten feet in height and are crowned with long, thin, grass-like leaves. There are trees that shed their bark instead of their leaves. You may also find tulips and lilies that grow as tall as trees, instead of as the low garden flowers that we know.

The most valuable tree that grows in Australia is the eucalyptus tree. It is found in great forests and in scattered groves, wherever trees will grow in this strange country. There are several hundred varieties of this tree. Some grow to a height of 300 feet. How do these compare with the giant trees of California? The eucalyptus trees have small tops, and their leaves turn their edges to the sun, so that they cast little shade on

the forest ground beneath. Some varieties of eucalyptus trees have bluish leaves, instead of green; others have gray leaves.

The eucalyptus produces a high grade of lumber. This is used for many purposes. Its leaves and bark contain valuable oils. Some of these have wide use in medicines. Probably you have used cold medicines which contain eucalyptus oil. Tars, dyes, and valuable gums are also obtained from these trees.

Another very common tree is the acacia tree. It has far fewer uses than has the eucalyptus.

Even the dry brushlands have strange growths. There are the wattle bushes with leaves shaped like spikes. There are salt bushes whose leaves the cattle eat because of the salt they contain. There are clumps of porcupine grass, so strong and spiny that one cannot push his way through them. Many of the bushes growing in the dry lands have very, very long roots that go far into the ground to reach moisture. Nearly every part of Australia has plants which you can find nowhere else in the world.

Animals of Australia. Perhaps the Australian animal you know best is the kangaroo. You may have seen one in a zoo or a circus. The great, gray kangaroo is the largest wild animal in Australia. Often it is taller than a man. There are other kangaroos which vary in size from these big fellows down to a tiny creature called the rat kangaroo.

All the kangaroos have long, powerful hind legs and very short front legs. They have long, heavy tails that help them in balancing themselves when sitting up or when moving. These animals do not run, but jump along on their hind legs. How they can hop! Measure off twenty-five feet on your classroom floor. That represents a fair leap for large kangaroos. They can hop along as fast as a horse can run.

A baby kangaroo is very helpless. Its mother has to carry it around with her for some time. She does this by placing

It is easy to see how the bottle tree gets its name.

Brown Brothers

The eucalyptus is Australia's most valuable tree. Its leaves and bark contain valuable oils and it produces a high grade of lumber.

the youngster in a large pouch, or pocket, of skin that grows on her stomach. Here the baby rides comfortably, sticking its head out to see what is going on.

The Dingo. The only large Australian animal which hunts is the dingo, or wild dog. It lived in Australia long before settlers came to the continent, and is not an ordinary dog which has turned wild. The dingo is a wolflike creature, covered with reddish hair. It has given the settlers much trouble because it likes to hunt and kill sheep.

Other Strange Animals. You would be especially interested in the platypus, or duckbill. This little creature is covered with fur and looks somewhat like a fat pussycat, but it has a flat bill like a duck and webbed feet. It lives in a hole in the ground, with one opening leading into the water and one leading to the surface of the land. When going to sleep, it rolls itself into a ball. Oddly enough, this creature lays eggs and hatches them. You would really wonder whether to call it an animal or a very queer bird.

Another remarkable creature is the flying squirrel, whose legs are connected by a web of skin. When it leaps from a branch and stretches out its legs, it can sail like the gliders some boys make. The skin makes it possible for the squirrel to sail quite a distance through the air. Australian flying squirrels are of several sizes. The smallest is called the flying mouse. One kind of flying squirrel is found in the United States.

Probably, when you were younger, you played with a toy teddy bear. Australia has the koala. It looks like a teddy bear

which has come to life. The koala is a gentle little creature which spends much of its life high up in the eucalyptus trees. It eats the leaves and drinks no water.

Why the Wild Animals Are Different in Australia. Unlike the other continents, Australia stands by itself, wholly surrounded by water. North and South America are connected with each other by the Isthmus of Panama. North America is joined to Asia much of the year by ice sheets. Europe and Asia are really one great body of land. Asia and Africa are joined by the Isthmus of Suez. Wild animals can pass from one continent to another, except in the case of Australia. It is believed that, in ancient times, Australia was connected by land with Asia. When this connection was broken, ages ago, there was no way for the animals then in Australia to reach any other lands, and no way for animals from other lands to reach Australia. The Australian animals were left to themselves. They developed into the strange forms now found in Australia, very different from the other animals of the world.

The great, gray kangaroo is the largest wild animal in Australia.

Keystone View Co. Inc. of N. Y.

Ewing Galloway, N. Y.

The koala, Australia's live teddy bear

Many years ago, a few deer were brought to Australia for hunting purposes. These animals, too, found the new country to their liking. Today there are many of the beautiful creatures in the grasslands and forests of the Island Continent.

Animals Brought to Australia by Settlers. There were no sheep or cattle in Australia when the first settlers came. Later, settlers brought them in on ships. These animals increased rapidly in numbers. Much of Australia's wealth today comes from her sheep, beef cattle, and dairy industries.

English settlers also brought over horses for farm work. Many are now raised in Australia. They are used in farming. They haul some of the great wagons in which goods are carried to and from the railways. They are used as saddle horses by herdsmen and travelers.

To help explore the Australian Desert, camels were brought from Africa. They seemed to feel very much at home in the

The platypus is covered with fur and looks somewhat like a fat pussycat with a flat bill like a duck.

Brown Brothers

Brown Brothers

The shape of the tail feathers gives the lyre bird its name.

desert lands, which are so like the Sahara. For a time they proved a great help in carrying men and supplies far into the desert. Now, trucks do much of this work. Some of the camels were turned loose and there are now herds of wild camels in parts of Australia.

A Serious Mistake. Without realizing it, a few of the early settlers made a great mistake by bringing over some rabbits. Because the climate was mild and there were few wild animals to hunt them, they increased very fast. Soon there were millions and millions of them. They spread out over the farm lands and grasslands, eating crops and feeding on the grass the sheep and cattle needed.

It was not long before the rabbits were seen to be a very dangerous pest. They were making the cattle and sheep go hungry. So the rabbits were hunted. But still they grew in numbers. Many wire fences, hundreds of miles long, had to be built to shut them away from the best lands. The rabbits inside were killed or driven out. Gates were built in the fences for people to pass through. Today, if a person fails to shut a gate after him, he has to pay a heavy fine. Riders are employed to "ride the fences" and keep them in repair, just as cowboys ride the fences on our western ranches.

Yet the many, many rabbits are not wholly useless. They are hunted for their meat and their skins. The meat is frozen and shipped to England. Our country buys large quantities of rabbit skins from Australia. Some of the fur is used with wool in making a fine quality of felt, from which hats are made.

Fish of Australia. Even some of the fish are strange creatures. As we have seen, Australian streams have a bad habit of drying up. None of our fish would live if that happened. But the Australian lung fish manages to get along, even if all water disappears. Like all fish, it has gills for breathing in water. It also has lungs for breathing in air. When

the river dries up, the lung fish simply burrows deep in the mud and breathes through its lungs until the water comes again.

Certain other fish are of ancient kinds not now living in other parts of the world.

Birds of Australia. The many beautiful birds of Australia would delight you. Some, like the brightly colored parrots and cockatoos, are similar to birds of other lands. Others are found only in Australia. Among these is the lyre bird. It is so named because of its beautiful, long tail feathers, which spread out in the form of a harplike instrument called the lyre. The tail feathers are very brightly colored. The lyre bird lives in the wildest parts of Australia. It is so shy that few people have seen one.

In ancient times, there were many giant, running birds on the earth. Only four varieties are found at the present day. One is the ostrich, a native of Africa. A second is the rhea, of South America. The other two are found in Australia. One of these is the cassowary. It is a shy bird and lives in the forests and jungles. The second bird is the emu. Next to the ostrich, it is the largest living bird. It is somewhat like the ostrich, but its feathers are dark and not as valuable. The emu lives in open plains and forests. It does not fly, but is a very fast runner. The emu is the national bird of Australia. Perhaps someone in the class who collects stamps has one from Australia with a picture of the emu.

QUIZ QUESTIONS

1. Use the globe to show several ways of reaching Australia from the United States. Which one would you like to take?
2. What stops are made on a sea trip from San Francisco to Australia?
3. What do you think is the most interesting thing about the people living in the Hawaiian Islands?
4. What stars, south of the Equator, take the place of the North Star, north of the Equator?
5. Where in Australia, is Sydney located?
6. What range of mountains lies along the eastern part of the continent?
7. Locate the deserts of Australia.
8. What parts of Australia have the heaviest rainfall?
9. What kind of forests grow in the region of heaviest rainfall?
10. In what part of Australia is the rainfall 20 to 40 inches?
11. Tell about the plant growth in these regions.
12. About how much of Australia has very little rainfall?
13. What happens in Australia in time of drought?
14. Tell about the largest river in Australia.
15. How far up the Darling River can boats travel? For what are these boats used?
16. What can you tell about the other rivers of Australia?
17. Tell about the lakes of Australia.
18. Why are the plants and animals of Australia of special interest?
19. Name two great running birds of Australia. Where does each live?

A MAP EXERCISE

1. Trace on the globe the course of your trip from San Francisco to Sydney.
2. Find a large island near the Australian continent and give its name.
3. About how wide is the mouth of the Gulf of Carpentaria?
4. What great bay, or bight, can you locate on the southern shore of Australia?
5. What island lies south of Australia?
6. What oceans wash the shores of Australia?
7. Are the cities of Australia located along the coast, or inland?
8. Where do you see signs of low mountains?
9. Locate the tropical regions of Australia. Name several birds and animals found there.
10. Locate the grasslands. What animals do you think are raised there?
11. Locate the desert areas. How do they compare with the grassland areas in size?
12. Locate:

Sydney	Queensland
Perth	Mt. Kosciusko
Adelaide	Murray-Darling River
Brisbane	
Canberra	Tasmania

SOME THINGS TO TELL ABOUT

1. Tell about the fern trees.
2. Tell about a hunting animal of Australia.
3. Tell about strange plants of Australia.
4. Tell about strange animals of Australia.
5. Tell about animals that have been brought to Australia by settlers.
6. Tell about rabbits in Australia.
7. Tell about the lung fish.

Ewing Galloway, N. Y.

The Aborigines, who are great hunters, are skilled in the use of both the boomerang and the spear.

THE PEOPLE OF AUSTRALIA

Discovery of the Continent. Australia was the next to the last continent to become known to the people of the Western World. The Dutch are believed to have discovered it, in about the year 1650. The portion they saw was too bare and rocky for them to make any attempt at a settlement. However, they did give the continent the name New Holland.

The English were more fortunate. An English seaman, Captain Cook, sailed along the east coast in 1770. He saw that Australia was really a great and fertile land. He entered a small bay and, after going ashore, took possession of the land for England. He named the bay Botany Bay, because of many strange and beautiful plants he found growing along its shores. Botany is the name given to the study of plants.

First Settlements. Eighteen years later, the first English settlement was made at Sydney, which became the capital of the colony called New South Wales. The first settlers were prisoners sent from the jails of England. It was not long, how-

ever, before people came to realize that Australia was a fine country. More settlers began to arrive from England. At first, only the brave and daring came, for the voyage was long and dangerous. In spite of the hardships and dangers, settlers kept coming. They made their homes on the fertile eastern coast, starting farms, and raising cattle and sheep from those they brought with them from England.

The Aborigines. The early settlers soon found that there were already people living on the continent. These settlers called them Blackfellows. The colonists soon pushed the natives back into the interior of the country. Here, some of them still live much as they did when white men came to Australia.

The skin of these Aborigines is really a rich brown. They are not related to the Negro tribes of Africa. Instead, they are believed to be a very different and a very ancient race. Their hair is straight or wavy, and their noses are flat.

In the wilder part of the country, they wear no clothing and live in the open in summer. If they live where winters are cool, they then wear a few skins of animals and live in simple brush shelters. They are great hunters, but grow no crops and make no pottery. They make fires with sticks, but have no objection to eating food raw. They eat anything —game, fish, snakes, lizards, worms, and insects. Many Aborigines who live near the settlements are much more civilized.

A few Aborigines help on the farms and ranches, but it is hard for them to stick to any work. They are, however, wonderful trackers of game.

Even the weapons of these people are ancient and strange. They use rude spears, clubs, and stone hatchets. Their most interesting weapon is the *boomerang*. Perhaps you have played with a toy boomerang. If so, you know that it is a curved stick. It is so shaped that it can be thrown into the air and will return in the direction of the thrower. The Aborigines are very skillful in its use.

Early Settlers. The men who took possession of the continent were almost all from England, the mother country. Nearly all the people who later settled there were also English. Few other white people, and almost no yellow or brown people, live in Australia.

How different this is from our own country! Do you remember how people from the Mediterranean lands of Spain, France, Italy, and Greece came to our land to live? White people from many other lands have come to America. The Indians have lived in America as long as we know. The Negroes were brought here to serve as slaves. The Chinese and Japanese have come in large numbers. Many, many races live in our country.

The Spread of Settlements. As in America, settlement in Australia began on the east coast and gradually spread to the west. The frontiers rolled back. Other settlements, besides Sydney, were made on the east coast, and a few were made on the south and west coasts as well. These settlements grew, and around them were formed colonies, each with its own governor and system of government, in much the same way that the thirteen original colonies were founded in our continent of North America.

During the early days of colonization, explorers were pushing out into every part of the continent. It was a wild, tough land, and it offered a strong challenge to even the bravest explorers. Some

of them got lost in the great unknown inland region and were never heard of again. Some perished in the blazing, dry heat of the desert, and others in the great steaming swamps along the northern coast. The story of these brave men is a thrilling chapter in the history of Australia.

Farmers and herdsmen were growing in number and doing well when something else happened. In 1851 gold was discovered. News of this brought many thousands of people from other lands. Australia began to grow up more quickly.

Towns sprang up in many parts of the country. Some towns grew into cities. Railroads added to the progress of the country. Coal, silver, iron, and other minerals were found in vast quantities. Trade and commerce rapidly increased, and manufacturing industries developed. Australia was rapidly becoming a civilized land.

Australian News and Information Bureau

Sydney is Australia's largest city.

Seaport Cities. Although sheep and cattle raisers, farmers, and miners have gone into the interior of Australia, most of her people live near the eastern and southern coasts. Here, where the climate is temperate, and there is sufficient water, are most of the large cities.

There are six good-sized seacoast cities. Brisbane is about halfway up the east coast. Five hundred miles to the south is Sydney. Next, in the southeastern corner, comes Melbourne. Northwest of it, near the mouth of the Murray-Darling River, is Adelaide, and over on the southwestern coast is Perth. All these cities look much like our seaports. Newcastle, one hundred miles north of Sydney, has iron and steel plants like those of Pittsburgh.

Sydney is the largest of the Australian cities. You would like Sydney, and you would feel very much at home there. Its streets are broad and well-paved. There are fine stores, beautiful tall buildings, a splendid public library, an interesting museum, a university, and many lovely parks. During the summer months, large

numbers of people flock to the beautiful sandy beaches to swim.

Sydney has a fine, deep harbor. Ocean steamers can come right up to the long docks, to load and unload their cargoes.

From Sydney are exported each year many shiploads of wool, wheat, meat, hides, skins, and cheese. From other countries, the ships bring to her docks cotton and woolen cloth, iron, farm machinery, paper, and other supplies.

Where the People Live in Australia. You remember that Australia is about the size of our United States. Yet its entire population of about 10,000,000 is only slightly larger than that of the state of Ohio. Nearly half of these people live in the six largest cities. You can see, then, how thinly settled most of this great country must be.

The Government of Australia. In time, the original colonies in Australia developed into states, much as the original colonies in America developed into states. The six Australian states are known as New South Wales, Victoria, Tasmania, Queensland, South Australia, and Western Australia. Five of these are on the mainland of the continent, and the other, Tasmania, is the island off the southern coast. These six states were independent of one another, which meant that it was difficult for them to work well together. To improve this situation, the Australian people, in 1901, established a national government, linking all six

Canberra, the capital city of Australia, was designed by an American.

H. Armstrong Roberts

H. Armstrong Roberts

Can you guess why Canberra is called the "Garden City?"

states together in much the same way that our government links the fifty states of our Union together. The Australian national government also runs the affairs of the thinly populated section of Australia known as the Northern Territory, where there are not enough people to organize another state. For some years, Melbourne served as the capital of Australia, but in 1927 the government was moved to the new capital city of Canberra.

The Capital City. Canberra, the capital city of Australia, is a small city of a few thousand people southwest of Sydney on a plateau in the mountains. Like our own capital city of Washington, Canberra is not in any one of the states into which Australia is divided. It is in a little area of land called the Federal District.

The city of Canberra was begun only a few years ago. It was designed by an American and, much like our capital city of Washington, was laid out before building began. On hills overlooking the city are the beautiful capital and parliament buildings. From these buildings, streets lead out in all directions, like the spokes of a wheel. Other streets cut across these, making great circles. If you ever go to Washington, you will see how a planned arrangement of streets makes it

easy to get from one part of the city to another.

The Future. The invention of automobiles, radios, airplanes, and farm and factory machinery has enabled Australia to develop very quickly. But large areas still await settlement and development. In the west and far north are open frontier lands, full of adventure and opportunity. The main problem is lack of water. The government is doing all it can to increase the supply.

Considering its size, Australia has very few people. There is need of many, many more who are willing to work hard in this prosperous new country. Families from England are given help if they want to move to Australia. Many have done so, and are helping in the development of the great Island Continent.

QUIZ QUESTIONS

1. Tell about the discovery of Australia.
2. What name was first given the continent?
3. Who claimed the continent for England?
4. What name was given the natives of Australia?
5. Describe these people and their life.
6. From what country did most of the later settlers come? Where did most of the people first settle?
7. In what direction did settlements spread?
8. What discovery brought thousands of people from other lands?
9. Name important minerals found in Australia.
10. Which is the largest city in Australia? Tell several facts about it.
11. What is the population of Australia?
12. How many people live in the seaport cities?
13. Name the capital city. Tell several facts about it.

A MAP EXERCISE

1. Locate and name the six states of Australia.
2. Which state do you think is the largest? The smallest?
3. In which state are the most cities?
4. Locate New South Wales. From the map, tell all you can about the state.
5. What do the maps tell you about Western Australia? About South Australia?
6. Where would you expect to find Aborigines today? Point to the region on the map.

A REAL OPPORTUNITY

This is an excellent opportunity for you to show how good an imagination you have. You have read the story of the people that live in Australia. Can you draw a picture about one of these groups? Perhaps you can combine these pictures and make a frieze for your classroom. You might choose the picture of the group you like best, then make a sand table model of it.

You might also have fun in making a play, to be given in assembly, of the story of one of the groups of people that live in Australia.

Ewing Galloway

Australia's main industry is stock-raising, with sheep products most important of all.

SHEEP AND CATTLE RAISING IN AUSTRALIA

Of course, many of you have seen a few sheep grazing in a pasture. A few of you have seen large flocks on our western lands. But to see sheep in really great numbers, you should visit the grasslands of Australia. Up until now, Australia's main industry has been stock-raising. In this industry, sheep have had first place. There are more than 100,000,000 of them in this far-off land. Australia leads all the world in the value of her sheep products.

Grazing Lands. The best sheep lands in Australia are in the southeastern part of the Murray-Darling Basin. Here there is usually enough moisture to make the grass thick and rich. North of this area, along the drier, grassy western slopes of the Great Dividing Range, is an immense sheep-raising region. Beyond the desert, along the western edge of Australia, are other grasslands where some sheep are raised.

Few people live in these sheep-raising regions. Sheep need so much land for pasture that they cannot be raised in large numbers where many people dwell. It takes but a few people to tend many sheep.

If it were not for sheep and beef cattle raising, the dry grasslands would be of little use to the Australians. These grasslands have too little water or rich pasture for dairy cattle. Besides, they are too far from the cities.

Because there is so little rainfall, crops cannot be grown. There are no forests, because trees, like farm crops, need much water. Sheep, however, can get along with little water, and they like to feed on the grasses and low bushes found in the grasslands. The sheep need no shelters, but can live out-of-doors all the year round.

Water in Dry Grasslands. In the drier grasslands where rivers frequently run dry, the ranchers dig enormous tanks in the dry soil. Into these, ditches lead water from the occasional rains and so store it for later use. Deep wells are also dug, from which engines pump the water.

On the broad western slopes of the Great Dividing Range, many wells have been dug. These wells are called *artesian wells*. The water reaches them in a curious way. In the rainy district on the eastern slope of the Great Dividing Range, much water soaks into the ground. Some of this water flows westward, underground, between layers of rock. Always, it flows downhill to a lower level. When men on the western slopes dig down through the ground and bore holes through the rock to this water, the water flows out and forms great pools where the cattle and sheep can drink. The farmers, in some places, dig ditches from these pools to carry a part of the water to their crops.

Sheep Ranches. In times past, the sheep grazed in great flocks over wide areas of open land. Now, there are many immense ranches, or "stations," shut in by miles and miles of wire fencing.

Each flock of two or three thousand sheep is tended by one or two herdsmen.

Great pools of water are formed when artesian wells are drilled through the rock to water sources.

Ewing Galloway, N. Y.

Ewing Galloway

The Merino sheep has long, thick wool.

With the help of their sheep dogs, these men drive their flocks to and fro across the fenced-in plains, moving on when the grass in one section is used up or water is too scarce. For months at a time, the herdsmen live with their flocks, seldom seeing other people. What a lonely life it must be!

Railways reach to only a small part of the sheep lands. Usually, when sheep are sent to market, they must be driven long distances to a railway. These trips may take many days. Regular paths, or trails, are followed. Along these trails, water and pasture land have been provided. So the sheep have food and drink during their long journey.

Sheep Products. When the sheep reach the railway, they are loaded on cars and carried to the cities. Here they are killed, and much of their meat is prepared for shipment to other countries.

Sheep are raised for their wool as well as for their meat. Australian sheep produce the finest wool in the world. Merino sheep grow much of this wool. Merinos are small animals, but their skin hangs down in great folds. They look as if they were wearing wool coats several sizes too large. These little sheep do not eat as much food as large sheep, but they produce just as much wool. They live well on the poor pasture of the dry grasslands.

When the wool is well grown, it is sheared, or cut off. What a busy time the shearing season is! The sheep are driven into fenced yards. From these, they are driven into small pens beside the shearing sheds. One by one, the men seize them, hold them down, and clip off the wool evenly without hurting the animal. Often they use electric clippers. With these clippers a man can shear a sheep in five minutes. That is a shorter time than it takes a boy to have his hair cut.

In good years, Australia produces more than twice as much wool as any other country. It is the most valuable product she sends to other lands. When there is rain and the grass is good, the sheep are healthy and the wool crop is large. Then the people are well off, for the sheep growers and dealers have much money to spend. But if one of the terrible years of drought comes, streams dry up

and the grass withers. The sheep suffer from lack of food and water. Many of them die. Then there is less wool to sell and it is of poorer quality. Such years bring hard times to the ranchers.

Cattle Raising. There are many cattle in Australia. Cattle raising is one of the country's chief industries. Some are raised for dairying, others for their meat, and for their hides or skins, from which leather is made.

Dairy Cattle. Most of the dairy cattle are raised in the southeastern part of the country near the coast. Here, the climate is mild. There is much rain in summer, and the pastures have rich grass. Dairy cattle need good food and plenty of water in order to give rich milk. They also need protection from the cold. The dairy farms are near the cities because milk must be delivered at the city homes while it is still fresh and sweet.

Not all the milk is sold to city homes. So much of it is made into butter and cheese that there is more of these products than the people of Australia can use. Large quantities are shipped to other countries —principally to England.

Beef Cattle. There are far more beef cattle raised than dairy cattle, because beef cattle do not need such good care and food. Instead of being kept on small farms, the beef cattle are raised on great ranches, most of which cover many square miles of land.

Some of the beef cattle ranches are on the northern and western coasts of Australia. Many more are on the high grassy slopes to the west of the Great Dividing Range. This, you remember, is also a great sheep country. However, cattle and sheep are never pastured together. The sheep spoil the pasture for the cattle by biting the grass down so short that the cattle cannot use it. Here, west of the Great Dividing Range, the pasture is not good and water is sometimes hard to get. Often, wells have to be dug to supply it.

When beef cattle are ready for market, they, like the sheep, are driven across country, mile after mile, to the railroads and shipping points. Tanks, wells, and

Dairy cattle are raised in a mild climate.

Ewing Galloway, N. Y.

Ewing Galloway

Beef cattle must be driven long distances to market.

dams, along the way, provide water. Sections of good pasture land are also set aside for these traveling herds, as is done for the sheep. Because of the heat and the dry land, the trip is very hard for the cattle, and in times of drought many die on the way.

Exports to England. Besides butter and cheese, Australia sends great quantities of beef and hides to England. With these go much sheep meat, called *mutton*. All these exports have to travel the 14,000 miles between Australia and England. The trip takes a number of weeks.

The ships have to sail through the tropics. Unless protected, meat quickly spoils in such heat, and butter and cheese become unfit for use. To protect the food from spoiling, refrigerator ships are used. These ships have refrigeration machines which keep the storage rooms very cold. Each kind of food carried in these ships is given just the amount of cold that will keep it best. As freezing does not hurt it, the meat is frozen hard. Butter and cheese are kept in rooms that are not quite as cold, as they would not be good if frozen. All these supplies reach England in perfect condition for use. Australia profits by their sale, and the people of crowded little England have foods they need, but which they cannot produce for lack of pasture lands.

Ewing Galloway

Springtime on a fruit farm in Australia. What season is it in the United States?

AGRICULTURE AND MINING IN AUSTRALIA

In spite of the great size of Australia, only a very small part of the land is devoted to agriculture. This is due largely to the light rainfall in many sections where the soil is good, to the years of drought, and to the few rivers that can be used for irrigation. However, there are large tracts of land that are not used because there are not enough people to farm them. There are many opportunities for more farmers in the Island Continent.

The Present Farming Lands. The best farming lands are in the southeastern part of the country, especially in the Murray-Darling Basin. Also, there is much farming along both sides of the Great Dividing Range. The two rivers offer opportunities for irrigation. Already, much has been done along this line. There is a large dam on the Murray River that forms a big lake for irrigation. Other dams on branches of this river in the states of Victoria and New South Wales water other lands. These great projects are especially helpful in times of drought. Artesian wells also are used to increase the water supply.

Wheat Lands. The white settlers in Australia quickly discovered that parts of the country were well suited to raising wheat. Wheat is now the main farm crop. In fact, Australia has become one of the great wheat exporting countries of the world.

The first plowing of the land in a new country is often difficult. Even if there is no tree growth to clear away, there are deep-rooted grasses and bushes. These make hard plowing. However, such new land is often very fertile. It will produce rich crops. Perhaps in your own neighborhood, you have seen lowlands cleared and planted for the first time. If so, you know what fine vegetables and other crops grow in the rich, dark soil. Australia was no exception, and the rich soil helped the early white settlers to grow good crops of wheat.

Wheat needs a good rainfall during the growing season, and dry weather during the time of ripening and harvesting. Except in years of drought, such weather is found in the basin of the Murray-Darling River and in sections of South Australia.

Planting and Harvesting the Wheat. If you visit the Australian wheat lands in the planting and harvesting seasons, you will see much the same sights as in the great grain fields of our own country. The plows, the harvesting machines, and the threshing machines that separate the grains from the straw are like those in our own land. In fact, many of them come from our country.

Scientists have developed special kinds of wheat suitable for growing under Australian conditions. Some types do well in the dry districts. Others do better in farm lands which have more rain. There are about 50,000 wheat farms in Australia, but room for many more.

Like Americans, the Australians use huge elevators in which to store wheat until it can be shipped to other points. However, the Australian farmers do not have to put their grain in great bins in their barns as we do in America. You will often see long, long piles, or stacks, of bags filled with wheat. These stacks are sometimes hundreds of feet long and several times as tall as you are, and they are stored right out in the open air. You see, when the Australian harvesting season comes, the weather is really dry. There is no rain at all. On this account, the wheat can be left outdoors until shipped. There is little danger of it being spoiled by moisture. The real danger in this form of storage comes from rats. Rats gnaw through the bags and do great damage to the crop.

In good years Australia cannot use all its wheat, and many great shiploads are sent to England and to other countries. How different are the years of drought!

Fruits. Because Australia has many kinds of climate, it is possible for her farmers to grow many kinds of crops. Even in the great Murray-Darling Basin, not all the farmers grow wheat or raise cattle and sheep. If you travel through this region, again and again you will come upon vineyards and fruit orchards. These are irrigated with water from the rivers.

The grapes are shipped fresh to the cities or are made into wines or are dried to make raisins. In the grape regions, also, grow many of the other fruits we see at home. There are orchards of peaches, pears, cherries, and apricots. Some of these are sold fresh. Others are canned or dried for later use. Peaches and apricots are the fruits most commonly preserved by drying. Large apples are grown in the island state of Tasmania. In the warmer sections, oranges and olives are grown. In the tropical regions, bananas and pineapples are cultivated.

Australian News & Information Bureau

Harvest time in an Australian apple orchard

Other Crops. In the warm sections north of the Murray-Darling Basin, fresh vegetables are grown during the winter season to supply the cities to the south, which have a cooler climate. That is just the opposite from our own land. Here winter vegetables are grown in our warm South, for the cities of the North.

In the temperate sections of Australia, you would see the common crops of our temperate farm lands—corn, oats, barley—and in the warm northern and central section, tobacco and cotton. Australia even produces her own sugar. The sugar cane is grown on great plantations in the hot, moist lands of the northeast. It is then made into sugar in great factories. When there is more than Australia needs at home, sugar is shipped to other countries.

You see that Australia has as wide a variety of crops as has our own land. This is a sign, too, that Australia has great differences in climate.

Mixed Farming. If you will look at your globe or your wall map, you will see that the southern half of the Great Dividing Range has little low land between it and the ocean. This narrow strip of land, however, has the best climate in Australia. The temperature is moderate, and the rainfall is good for growing crops.

Because the region has so good a climate, far more people live there than anywhere else in Australia. Most of the towns and cities are there. Naturally, this leaves less land in this section for the farmer, and the land itself costs more. Because of this, the farms are usually small. Each farmer raises several dif-

ferent kinds of crops instead of just one. This is called mixed farming. One little farm will have its dairy, will grow all the common vegetables in season, will raise some wheat, corn, or other grains, and will grow fruits.

To get large returns from his small space, the farmer must cultivate his land most carefully. Still, he is well paid for his trouble, because he has his market right at hand. What he and his family do not need can be sent to a near-by city. There the fresh farm products are gladly bought by the people who are busy in other lines of work.

Mining. Besides her sheep and cattle, her wheat and other crops, and her forest products, Australia is rich in minerals. Gold is found here and there in the eastern, western, and northern parts of the continent. Australia once produced a large part of the world's gold supply, but now her output is much smaller.

Today, silver and lead are equally as important as gold. There are fine beds of copper, tin, coal, and iron. All these materials are now mined. Some precious stones are also found. There are many pearl fisheries on the northern coast.

Manufactures. Australia has thousands of factories. These use the products of her soil and mines to make many things the country needs. Among them are splendid modern steelworks.

Railroads and Shipping. With so many valuable products, Australia needs good means of moving them across the country to meet her own needs and to ship products across the seas.

You have already learned that sheep and cattle have to be driven long dis-

Most of Australia's minerals are found in the low, rugged mountain ranges.

Australian News & Information Bureau

Ewing Galloway

This great plant takes gold, silver,and lead from ores mined beneath the surface.

tances to railroads or to market. Wool, wheat, and some mining products must also be hauled long distances in wagons or trucks. The main settled parts of the country are well supplied with railroads, however. There is a rail line across the southern part of the continent, and another running north from Perth. On the southern line, there is one stretch of 300 miles that forms a perfectly straight line.

One odd thing about Australian railroads is the difference in *gauge* of railroads in different states. The gauge is the distance between the two rails of the track. One railroad may be narrow gauge, another may be broad gauge. On a long trip, one may have to travel over two or more railroads, each with a different track width. Thus the cars of one road cannot travel over the tracks of another road. At each connecting point, passengers have to change trains. Freight, also, has to be unloaded from one set of cars and then loaded into others. In our country railroads have the same standard gauge.

Shipment of goods across the oceans is a very different matter. Australia's cities are seaport cities. Some have fine harbors. The loading and unloading of great ships can be done easily and quickly.

Australia and Other Lands. You have studied about Australia, the Island Continent, with its many regions. Can you name these regions? Where, throughout the world, are similar regions?

Australia raises many crops and large numbers of sheep and cattle. In what regions? Can you name regions throughout the world where the same products are raised?

QUIZ QUESTIONS

1. About how many sheep are there in Australia?
2. Where are the best sheep lands?
3. Why are the dry grasslands better for sheep raising than for farms and dairies?
4. In what ways do the ranchers provide water for their herds when streams dry up?
5. Are the sheep kept on open ranges or enclosed ranges?
6. How do sheep reach the markets and seaports?
7. How does Australian wool compare with wool from other countries?
8. Describe the shearing of the sheep. Tell what becomes of the wool.
9. For what two purposes are cattle raised in Australia?
10. For which purpose are more cattle raised?
11. Where are dairy cattle raised? Why?
12. Where are beef cattle raised?
13. How do beef cattle reach shipping points?
14. What provision is made for them on the way?
15. How are foods kept from spoiling while being shipped from Australia to England?
16. Why is so small a part of Australia's land cultivated?
17. Why is it harder to prepare new land for crops than land which has been farmed before?
18. Where do the Australian wheat growers get many of the machines they use?
19. How do the Australians store the wheat after it is threshed?
20. What animal often causes serious damage to this grain?
21. How are the vineyards and orchards in the Murray-Darling Basin supplied with water?
22. From what region do the cities of Australia get their fresh vegetables in winter?
23. How is Australia supplied with sugar?
24. What portion of Australia has the best climate? Why?
25. Name several kinds of crops raised by the farmers in this region.
26. Name at least four products of the Australian mines.
27. Where are the main railroads located? What makes railroad transportation over long distances somewhat difficult?

A MAP EXERCISE

1. On the globe, trace the shortest sea routes from Sydney to England; to San Francisco; and to New York by way of the Panama Canal.
2. Make a sketch map of Australia. Using the maps in the book, locate the grassland areas and mark where sheep and cattle are mostly raised.

YOUR GEOGRAPHY DICTIONARY

NOTE: These are not complete definitions. They are simple, descriptive definitions which give an understanding of the important geographic terms used in this text.

KEY TO PRONUNCIATION

ā as in āte, mākeր
ă as in ăm, hăt
ă· as in finăl, ăccount
â as in pârent, câre
ä as in ärm, fäther
à as in àsk, stàff
ȧ as in sofȧ, ideȧ
å as in vâcation
ę̄ as in hę̄re
ē as in ēve, concrēte
ĕ as in ĕnd, pĕt
ĕ as in recĕnt, novĕl
ê as in bêgin, êvent
ẽ as in evẽr, watẽr
ī as in īce, chīld
ĭ as in pĭt, ĭll
ĭ as in charĭty
ō as in ōld, nōte
ŏ as in nŏt, hŏt
ŏ as in cŏntented
ô as in lôrd, ôrder
ô̇ as in ôbey, tôbacco
ô̇ as in sô̇ft
oi as in oil, boil
o͞o as in mo͞on, bo͞ot
o͝o as in bo͝ok, lo͝ok
ou as in out, about
ū as in ūse, cūbe
ŭ as in ŭp, tŭb
ŭ as in circŭs
û as in bûrn, hûrl
û as in ûnite

Altitude (ăl′tĭ tūd): Height above the level of the sea. *Example:* Mount Kosciusko in Australia has an altitude of over 7,300 feet.

Antarctic Circle (ănt ärk′tĭk): An imaginary line running around the earth 66½° south of the Equator. It separates the South Temperate Zone from the South Frigid Zone.

Arctic Circle (ärk′tĭk): An imaginary line running around the earth 66½° north of the Equator. It separates the North Temperate Zone from the North Frigid Zone.

Artesian well (är tē′zhăn): A well from which water flows continuously. *Example:* The Artesian wells of Australia.

Avalanche (ăv′ȧ lânch): A great mass of snow and ice, or of earth and rocks, sliding down a mountain side. *Example:* The avalanches of Switzerland.

Axis of the Earth (ăk′sĭs): An imaginary line running through the earth from the North Pole to the South Pole.

Basin (bā′s'n): The land drained by a river and its tributaries. *Example:* The Amazon Basin.

Bay: A body of water extending into the land. *Example:* Chesapeake Bay.

Beach: A stretch of low, flat, usually sandy, shore.

Bight (bīt): An open bay. *Example:* The Great Australian Bight.

Bore (bōr): A wall of water which heads the incoming flood tide near the mouths of certain rivers. *Example:* The bore of the Amazon.

Canal (kȧ năl′): A waterway built by man. *Examples:* Suez Canal, Panama Canal.

Canyon (kăn′yŭn): A deep, narrow valley with steep sides, usually caused by the wearing away of rock and soil by a stream. *Example:* The Grand Canyon of the Colorado River.

Cape: A point of land extending into the water. *Examples:* Cape Arnhem, Cape York.

Channel (chăn′nĕl): The deeper part of a waterway or stream.

Climate (klī′mĭt): The kind of weather a region usually has.

Coast: The seashore.

Continent (kŏn′tĭ nĕnt): One of the seven great bodies of land, which are Asia, Africa, North America, South America, Europe, Australia, and Antarctica. Europe and Asia, together, are sometimes called Eurasia.

Current (kûr′ĕnt): The more swiftly moving water in a stream or other body of water. *Examples:* The Gulf Stream, the Japan Current.

Delta (dĕl′tȧ): A low, flat plain at the mouth of a river, formed by mud deposited by the river. *Examples:* The Nile Delta, the Rhine Delta.

Desert (dĕz'ērt): A region having little moisture or plant life. *Example:* The Sahara Desert.

Dike (dīk): A wall of dirt, stone, or cement built to keep the sea or other waters from flooding lowlands. *Example:* The dikes of the Netherlands.

Divide (dĭ vīd'): High land separating river basins. *Examples:* The Continental Divide, the Great Dividing Range.

Dune (dūn): A low, rounded hill of sand. *Examples:* The dunes of the Sahara, the dunes of the Netherlands.

Earth (ûrth): The world of land and sea on which we live.

Earthquake (ûrth'kwāk): A shaking or trembling of the earth's crust.

Equator (ē kwā'tĕr): An imaginary line running around the earth midway between the North and South poles.

Fiord (fyôrd): A deep, narrow bay bordered by high, steep hills. *Example:* The fiords of Norway.

Forest (fŏr'ĕst): A large tract of land covered with trees. *Example:* The forests of the Congo Basin.

Geography (jē ŏg'rȧ fĭ): The study of the earth and life on the earth.

Geyser (gī zĕr): A hot spring which hurls water and steam high in the air. *Example:* The geysers of the Yellowstone National Park.

Glacier (glā'shĕr): A slow-moving river of ice. *Examples:* The glaciers of the Arctic regions, the glaciers of Switzerland.

Globe (glōb): A model of the earth.

Gorge (gôrj): A narrow valley with steep, rocky sides. *Example:* The gorges of Switzerland.

Grasslands (grȧs'lănds): Plains covered with grass. *Example:* The grasslands of Africa.

Gulf (gŭlf): A large bay. *Examples:* The Gulf of Mexico, the Gulf of Carpentaria.

Harbor (här'bĕr): A bay where ships may find safe shelter from storms. *Examples:* The harbors of Amsterdam and Rotterdam.

Hemisphere (hĕm'ĭ sfēr): Half of the earth or the globe, as if made by a straight cut through the center. *Example:* The Western Hemisphere.

Highland (hī'lănd): A name given to hilly or mountainous country. *Example:* The Western Highlands.

Hill (hĭl): A high mound of land. *Example:* The hills of the Appalachian Highlands.

Horizon (hō rī'z'n): The line where earth and sky seem to meet.

Irrigation (ĭr ĭ gā'shŭn): The watering of dry lands for the purpose of raising crops.

Island (ī'lănd): A body of land entirely surrounded by water. *Examples:* Newfoundland, Australia.

Isthmus (ĭs'mŭs): A narrow neck of land joining two larger bodies of land. *Examples:* Isthmus of Suez, Isthmus of Panama.

Jungle (jŭng'g'l): A dense forest in the Hot Belt. *Examples:* The jungles of the Amazon Basin and the Congo Basin.

Lake (lāk): A large inland body of water entirely surrounded by land. *Example:* Great Salt Lake.

Latitude (lăt'ĭ tūd): Distance north or south of the Equator, measured in degrees.

Lava (lä'vȧ): Melted rock which flows from a volcano. The same rock when it has cooled and is hardened.

Longitude (lŏn'jĭ tūd): Distance east or west of a certain point called "prime meridian," measured in degrees.

Lowland (lō'lȧnd): Along the shore, land which is near sea level. Inland, land which is much lower than nearby land.

Map scale (măp skāl): A divided line on a map used to measure true distances.

Map symbol (măp sĭm'bŭl): A figure, or sign, commonly used to stand for a particular object. *Example:* A twisting, turning line to represent a stream.

Marsh (märsh): A section of flat, muddy land covered with water grass.

Meridian of longitude (mĕ rĭd'ĭ ăn of lŏn'jĭ tūd): One of the imaginary lines on the earth's surface which measure distances east and west.

Mesa (mā'sȧ): A flat-topped hill with steep sides.

Mountain (moun'tĭn): A very high hill. *Examples:* The Rocky Mountains, Mount Whitney.

Mountain pass: A narrow passage between mountains. *Example:* The passes of the Alps in Switzerland.

Mountain range: A series of connected mountains. *Example:* The Rocky Mountain range.

Mud flat: A low, muddy section of the seashore which is covered with water only at high tide. ***Example:*** The mud flats of our northeastern coast where clams are dug.

North Pole: The most northern place on our earth.

North Star: A star in the sky directly above the North Pole. We use it to determine the north direction.

Oasis (ō-ā'sĭs): A place in a desert where there are springs or wells, and where plants grow. ***Example:*** The oasis of Ghat in the Sahara Desert.

Ocean (ō'shăn): One of the four great bodies of water. The four oceans are the Pacific, the Atlantic, the Indian, and the Arctic.

Ore (ōr): Rock containing metals, as found in the earth. ***Example:*** Iron ore.

Parallel of latitude (păr'ă lĕl): One of the imaginary lines on the earth's surface which measures distances north and south of the Equator.

Peninsula (pĕn ĭn'sû lȧ): A body of land extending into the water. ***Example:*** The peninsula of Italy.

Plain (plān): A fairly level tract of land. ***Example:*** The Central Plains of the United States.

Plateau (plă tō'): A high plain. ***Example:*** The plateau of the Congo Basin.

Polders (pōl'dĕrz): Sections of low land drained from the sea by enclosing them with dikes. ***Example:*** the polders of the Netherlands.

Prairie (prâr'ĭ): A large area of grassland.

Reef (rēf): A ledge of rock just below the surface in a body of water.

River (rĭv'ĕr): A large stream of flowing water. ***Examples:*** The Colorado River, the Amazon River.

Sea: A body of salt water smaller than an ocean. ***Examples:*** Mediterranean Sea, Arabian Sea.

Sound: A body of water larger than a strait, which connects two larger bodies of water or which lies between an island and the main shore. ***Example:*** Long Island Sound.

South Pole: The most southern place on our earth.

Strait (strāt): A narrow body of water connecting two larger bodies of water. ***Example:*** The Strait of Gibraltar.

Sun: The star around which the earth revolves. The sun gives heat and light to our earth.

Swell: A long, low wave at sea, even when no wind is blowing.

Temperature (tĕm'pĕr ȧ tûr): Amount of heat.

Terrace (tĕr'ĭs): A level place on the side of a hill. ***Example:*** The terraces on the hills along the Mediterranean.

Tides (tīdz): The regular rising and falling of the ocean twice a day. A rising tide is called a flood tide. A falling tide is called an ebb tide.

Tributary (trĭb'û-tĕr ĭ): A river or stream which flows into, or feeds, a larger river or stream. ***Example:*** The tributaries which feed the Amazon River.

Tropic of Cancer (trŏp'ĭk of kăn'sĕr): An imaginary line running around the earth 23½° north of the Equator, separating the North Temperate Zone from the Torrid Zone. It marks the farthest north that the sun's rays are ever directly overhead.

Tropic of Capricorn (kăp'rĭ kôrn): An imaginary line running around the earth 23½° south of the Equator, separating the Torrid Zone from the South Temperate Zone. It marks the farthest south that the sun's rays are ever directly overhead.

Valley (văl'ĭ): A stretch of low land lying between hills or mountains. ***Example:*** The Swiss valleys.

Volcano (vŏl kā'nō): A mountain from which fire, smoke, ashes, and melted rocks are thrown out. ***Example:*** Mount Vesuvius.

Waterfall (wô'tĕr fâl): Water falling over a cliff. ***Example:*** Yosemite Falls.

Watershed (wô'tĕr shĕd): High land separating river basins. ***Examples:*** The Continental Divide, the Alps watershed.

Zones (zōnz): The five great divisions of the earth according to the angle of the sun. The five zones are the Torrid Zone, the North and South Temperate zones, and the North and South Frigid zones.

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